THE

UNITED SERVICE.

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WANTS OF THE NAVY.[1]

IRONCLAD CRUISERS.

AMONG the many wants of the navy none is more prominent than that of ships; and among the many subjects on which differences of opinion are entertained by officers this one of ships occupies a prominent position. It is very desirable that the navy should make up its mind as to what is required in the way of ships for the service, so that all efforts that may be made to influence legislation in this direction may be carried on on an established, well-understood, and matured system; so that all may speak with one certain voice; so that Congressmen may not be bewildered and discouraged by having inconsistent and contradictory propositions submitted to them; and so that all the influence that each can bring to bear may be concentrated on "a long pull, a strong pull, and a pull all together."

In European countries, where distances between points in the state are comparatively short,—notably in England,—the establishment of Naval Institutes affords an easy means for officers to communicate their ideas to each other, and to discuss such propositions as may be advanced; but in our country, owing to the greater distances between points and the expense of travel, it is impossible by this means alone to achieve such an understanding between the members of the profession as can result in a united effort. It is true that the present attempt to increase the number of stations for the assembling together of the members of our own Naval Institute is a step in the right direction; but even this expedient to obviate the difficulty introduces another objectionable ele-

[1] Some paragraphs in this article are extracted, with permission, from a paper published in the *Galaxy*, in October, 1877.

ment, namely, division, which might result in one decision on a controverted point being arrived at by one chamber, and another decision being arrived at by another chamber, whereas if the remarks and arguments of all had been heard by all, a harmonious result might have been the consequence. The pages of THE UNITED SERVICE offer a common ground on which we can all meet, and I recommend that it be utilized for the discussion of the subject, so that the ideas advanced may be known to the whole service, and all may be able to contribute to help the accomplishment of the object in view.

The navy requires several classes of ships, but, whatever may be the need for other classes, I submit that our want of an ironclad fleet is the most important point for discussion. The object of this paper is to show the necessity of armored cruisers, and to suggest a type of vessel to be taken as a standard of reference in designing the ship of the future. To start fairly in this work, it would seem that the service in which the ships are to be employed is the essential requirement to be kept in view; whether they are to be used for floating-batteries or for sea service. The efforts that have been made to combine these qualities in one vessel have failed; our monitors, for which was claimed, when they first appeared, the capacity of sea-going ships, have by common consent been relegated to the region assigned to floating-batteries, movable, indeed, but yet only floating-batteries; and the turreted ships of other nations cannot be regarded as efficient cruising vessels.

The most marked class of turreted vessels which illustrate the impossibility of combining in one vessel conflicting requirements, needed in performance of differing services, are the Popoffkas, the circular ironclads of Russia. These vessels have been much ridiculed, but yet the circular form adopted by Admiral Popoff was but the logical conclusion to which were tending all the changes in the dimensions of vessels which were being built by other nations of Europe. The proportion between length and breadth of ships was being constantly altered in one direction,—length was being diminished, and breadth was being increased; they were approaching each other, and the Russian experiment was the solution that the problem indicated. There is no doubt that the vessels are complete failures for all purposes except that of floating-batteries, and if they had been constructed for that purpose, they could have been made much more efficient than they now are. The reason for the change in the form of ships which is being practiced by so many nations is that the old models cannot bear the enormous weight of the armor which is now considered indispensable for a fighting ship; floating capacity must be supplied, hence the change of form. Here comes up the question that we wish to submit for the consideration of the navy, and on which it is to be hoped that officers will come to a conclusion, so that our course for the future may be shaped, and we may design what is to be our fighting cruising ship

of the future. *Is this great weight of armor indispensable for a fighting ship?*

There is among officers of the navy much difference of opinion on this point. There are some officers, whose opinions are received with consideration, who would suppress armor altogether, who look upon its day as having passed; others again would accept without reserve the results of the practice of other nations, and would follow in their wake. It may be found that there is a happy mean between these two extremes.

In opening a discussion on this very important subject, it is right to establish first that there is a necessity for armor; that in view of the present condition of ordnance it would never do to yield to the opinion of those who would throw armor out of consideration altogether, and who would expose our wooden or thin iron sides to the destructive effect of modern artillery.

We must go back some years and trace from the beginning the causes that have brought armor to the fore. We are not about to state anything new, and we may be accused of old-fogyism for referring to bygone times; but it can never do harm to any one to turn back to first principles, and to test modern advancement by the lessons that were taught by them.

We refer, then, to the circumstance in the history of naval artillery which originated the idea of armor for ships of war. This circumstance was the adoption of horizontal shell firing from cannon.

Previous to about 1840 the armament of ships consisted of cannon from which were fired only non-explosive projectiles, round-shot, chain-shot, grape, canister, etc. The firing of explosive projectiles was confined to mortars always fired at an elevation, the shell being known under the name of *bomb*. No effort was made to adopt the shell for horizontal firing from all cannon until 1836, when Colonel Paixhans, of the French artillery, demonstrated the feasibility and safety of their use. The introduction of shells and shell guns into the navies of the world was gradual, and it was not until after many years that the entire batteries of vessels of war consisted of guns for all of which shells were supplied.

The probable destructive effect of shells exploding in the sides or on the open decks of ships was recognized by all, and experiments at targets sufficiently proved it. But circumstances on a practice-ground and in action are so dissimilar, that the experiences of a naval action were looked forward to with much interest in order to satisfy as to the effect of these projectiles in all the varying conditions of a sea-fight. Some time elapsed before the baptism of war put the seal of approval on the new missile.

It is worthy of remark how few engagements between ships have taken place since the introduction of shells; but on every occasion of

their use, when wooden ships were engaged, the effect has been most decided and complete. Previous to the war now being carried on between Peru and Chile, three instances only can be referred to of purely sea-fights, viz., the engagement between the Russian and Turkish fleets at Sinope during the Crimean war, the engagement between the U. S. S. "Hatteras" and the Confederate cruiser "Alabama" during the war of the Rebellion, and the fight between the "Kearsarge" and "Alabama" during the same war. In the affair at Sinope the Russian ships used shells, the Turks had only solid shot. The result was the total destruction of the Turkish force. Not one ship escaped: all were burned or sunk. The fight between the "Alabama" and the "Hatteras" resulted in the sinking of the "Hatteras"; and the contest between the "Alabama" and the "Kearsarge" ended the career of the "Alabama." It is well to notice that but for the *failure to explode* of a shell that was embedded in the stern-post of the "Kearsarge," that vessel might, and probably would, have accompanied her antagonist to the bottom of the sea.

The gallant attempt of Rear-Admiral Lyons, with his wooden fleet, before the forts of Sebastopol, is an instance which proved the uselessness of subjecting unarmored vessels to the steady fire of fortified works using shells from their batteries.

These facts, these records of history, should be sufficient to satisfy the opponents of armor of the weakness of their position when they assert that the day of armored vessels is past. It is only because there have been so few instances where the power of the shell has been demonstrated in action that the fact of the necessity of armor does not take hold of all minds. The more the matter is deliberately considered, the more apparent will become the certain destruction of unarmored vessels going into action when shells are the projectiles to operate against them.

The necessity of providing a defense against shells was recognized both by England and France during the Crimean war, and a protection of armor was supplied to some floating-batteries built at that time which were intended to operate before fortified positions; and at the conclusion of that war the English built the "Warrior" and the French built "La Gloire." These were the first specimens of ironclad ships of war. They were capable of successfully resisting the entrance of shells from guns of the period, but were not proof against solid shot at short range, when striking at right angles to the side. The armor was limited to the protection of the battery and the men employed at the guns. The forward and after parts of the vessel were unprotected. This arrangement left some vital parts of the ship exposed, a want which was supplied in subsequently-built vessels, which were provided with a belt of armor about the water-line, reaching from stem to stern, which protected from horizontal fire the steering-gear, etc. The only

modification in form that was rendered necessary by this arrangement was the suppression of the usually projecting bow, which was dispensed with so as to avoid the overhanging weight. The thickness of the armor of the "Warrior" was four and one-half inches, but in her construction the sharp-angled transverse section was retained, which rendered an increase beyond ordinary length of hull necessary in order to provide floating capacity for the weight of armor.

On the appearance of these ships the *war at the butts* commenced. At Shoeburyness, in England, and at Gâvres, in France, there were set up "Warrior" targets and "Gloire" targets, which were duly fired at with the artillery of the day. The calibre of guns was increased, and thickness of targets as well. New vessels were constructed to carry the increased thickness of armor and the guns of increased calibre and weight; the spirit of emulation was aroused between the nations, each vying with the other for precedence, until England was allowed to continue alone the bloodless war of guns *versus* armor, her efforts resulting in the construction of monster cannon and in the adoption of models suited to carry this ever-increasing weight.

It does not seem reasonable to overload a sea-going vessel in this manner, to force her to stagger along in motion under a load that can only be properly borne when at rest. The attempt forces a departure from the well-known useful form of a sea-going ship. The present form in use is known to be the best for speed, for accommodation, and for contending with the elements at sea, and it should not be set aside without better reasons than can be quoted up to the present time. If we accept the evidence of the *butts* alone, we see reasons for the change; but this is not sufficient unless we choose to conclude that the results in service would correspond with them, *which cannot be the case.*

It must be borne in mind that in target practice we note the effect that is produced under the best possible conditions for the gun. The target is set up at short range, generally not exceeding two hundred yards, and the line of fire is at right angle to the surface struck. This relative position is indispensable for the perfect operation of the rifle projectile, for the least deviation from these conditions has a great effect on the consequences of impact. The forward part of all rifle projectiles is so shaped that a slight angle at the point of impact interferes with penetration by deflecting the missile, and this effect would preserve the hull of a vessel from injury much more than would additional thickness of armor if struck perpendicularly. This is the character of impact that would most naturally obtain during an engagement at sea, where both vessels must be supposed to be in motion, constantly changing their relative positions, and seldom presenting their sides at right angles to the fire of the enemy. A familiar home illustration of the protection afforded by inclination of the surface struck is the "New Ironsides" during her engagements at Charleston. The tumble-in

formation of her side prevented all projectiles, whether from rifled or smooth-bored cannon, from having any but a superficial effect upon her armor; one shot which struck her was so much deflected that it pursued its flight almost vertically upwards, striking the truck at the masthead. The effect upon the armor of this vessel, from this cause, was so slight that it is safe to conclude that she could have passed scatheless through the war with armor of less thickness than what she carried, which was only four inches thick, but it was good rolled iron; not the thin laminated plates with which the monitors' sides were covered. The result in the case of the "New Ironsides" would have been very different if her plates had been set up vertically, and had been struck by the same artillery at right angles to their surface, as would be shown if we were to try it on a target-ground, but here we have the best possible proof that the evidence of target practice should not be accepted as binding on us in providing armor for our ships; on the contrary, the circumstances of an action with ships in motion ought to have a *more* prominent place in our calculations, and we ought to consider a vessel as sufficiently protected if she is supplied with plates that will deflect projectiles striking at an angle to the surface of the side.

Although a certain thickness of armor, then, is absolutely necessary to protect a sea-going fighting ship from modern artillery, we should abandon the effort to make the ship invulnerable under all directions of fire; for by persevering in this effort we make it impossible to construct ships of moderate size, thus expending on one vessel what would provide us with two or more smaller vessels, which would render better service. The effort among nations seems to be to construct something in the form of a ship that shall be invulnerable, and at the same time irresistible; but this effort is to achieve the impossible, for, whatever target may be put up, a gun can be made to pierce it; and while we are fixing our eyes upon these efforts to accomplish what is impossible, and which would be of no practical use if accomplished, we are wasting time and are throwing away golden opportunities to profit by the experience that we already have. The writer believes that he speaks the mind of many a thoughtful professional man who has watched the progress of events with interest, but without being convinced of the practical usefulness of many of the results, —of men who approve of the use of armor and of the increase of calibre of guns up to a certain point, bounded and limited by practical usefulness, but who only regard the steps taken beyond as experiments curious and interesting in themselves, but as of no practical value from a professional point of view. It is to these that the writer wishes to join himself in an effort, by joint suggestion and discussion, to propose some plan or system for building up a suitable ironclad fleet for the United States. It is not his opinion that the whole navy should be

included in this ironclad fleet of cruising ships, far from it; for the ordinary purposes of a cruising navy, and in order properly to assume our position afloat among the great nations, we require several other classes of ships, but an ironclad fleet is one thing indispensable, and the gradual construction of this should be now our first effort. What do we see as the practice of other maritime people who stand as our equals as great nations? We see that every ship flying the flag of a commander-in-chief is an ironclad cruiser. The flag-ship conveys the idea of power, and is at the same time an advertisement of the cunning of the native workman. This is a good example to follow. Compare with this the "Monocacy" in China, and the "Shenandoah" in the South Atlantic, flying the flags of commanders of squadrons, and we have an idea of the comparative impressions produced by the flag-ships of the United States and those of other countries. Our poverty in ships has brought about this humiliating state of things; the Navy Department is powerless to avoid such exhibitions of our weakness so long as proper ships are not put at its disposal; and the flag-officer who, as the representative of his great country, is called upon to receive and to entertain royalty, and all lesser notabilities, is placed in a position of embarrassment and mortification, being required either to forego what he knows his position should constrain him to do, or else to make an effort to do it in a manner that can only be a penance to him and to the recipients of his attentions.

This matter of entertainment may be regarded by many who are unfamiliar with its requirements as a small matter, but it is not so, navy officers know it well; gross offense is given at times by its neglect, and the non-observance of these courtesies reflects on the whole country, on its civilization. A flag-officer placed on board a vessel rated as a commander's command is in no position to support the dignity of his position. There is no reason why this state of things should be continued. Our country is rich beyond compare; the chief trouble at the Treasury is how to dispose of the surplus revenue, and at the same time we have a most economical and strictly honest administration of the Navy Department, every penny is strictly accounted for, and is devoted solely to its appropriated purpose. We hear of one million and a half dollars being returned into the Treasury of unexpended balance of last year's appropriations: not that it could not have been usefully expended for the general purposes of the navy, but it is the accumulation of balances on the different items under the various heads of appropriations.

Why might this unexpended balance not have been used to defray part of the expenses necessary for the construction of a sea-going ironclad vessel that could carry the flag of the country and of a rear-admiral to European waters? Let other sufficient sums be appropriated for the construction each year of another vessel of a similar type; continue

this for one decade, and we will be in possession of a formidable fleet without the country being conscious of a drain. And during this ten years what an impetus will be given to our home industries! Encouragement will be given to our iron-ship builders and to all trades that depend on them, and *every penny paid out will be received by our own people.* No good reasons can be given why we should not advance in this road to improvement, and yet we rest in a lethargic sleep, indifferent, and enduring all the ills of our want of action. If the impetus be once given, there can be no doubt that we can go on to a high pitch of perfection. We have all the material, we have the workmen, the spirit yet is wanting. When the ball shall be once put in motion, it will roll briskly along. How is the power to be applied?

Great things have resulted from small beginnings. May it not be possible that a call now made to the intelligence of the service to come forward and to discuss this subject (in the columns of THE UNITED SERVICE) may lead to the result that all lovers of the navy desire, that we may be able to build up and restore the navy to the rank that it should hold among the navies of the world? What do we require as a point around which to assemble for the discussion? We want general ideas. In the multitude of counselors there is wisdom. We want to sift the subject. What better plan can there be than to set up a type and to subject it to criticism? It is much easier to criticise than to originate; it is easier to demolish than to construct. Although, then, we presume to propose a type, we do it with reserve, simply for the sake of the arguments that may follow.

The vessel that we will set up as the type for our ironclad cruisers, to form, when assembled together, our ironclad cruising fleet, is H. B. M. ship "Alexandra," of which we have the best description in that invaluable work of Chief Engineer J. W. King, of the U. S. Navy, "Report of European Ships of War." We select this vessel because she is a ship with her battery mounted on broadside, for we would dismiss the idea of associating a movable turret with a sea-going ship of war. The "Alexandra" has a broadside battery, but, at the same time, she possesses the advantages of a turreted ship in having an all-around fire, which, after all, is, with one exception, the only argument in favor of a turret, the other argument being that guns can be worked in a turret which it is impossible to work by man-power; this necessitates the use of a turret where it is desirable to use such guns as cannot be manipulated by men (of which we propose to treat at another time), but for our sea-going ironclad cruisers we want no guns that cannot be worked by man-power alone.

We seem to have in the "Alexandra" a most happy combination of advantages. Earlier constructions have some of her good points, foreshadowing, as it were, this vessel, in which they are all combined. In order to point out in detail the advantages of this vessel, it would

be necessary to transcribe from the pages of Chief Engineer King's report, and a copy of his plate would be necessary; but his work is no doubt easily attainable by the readers of this magazine, who can study the ship at their leisure. It will suffice to state here that the ship has a battery of twelve guns, eight of which constitute her main-deck battery, and four are mounted in an upper battery, which is situated over that portion of the main-deck battery in which are contained the six after-guns. The forward iron bulkhead of the upper battery is continued down through the main-deck battery, dividing it into two parts, thus leaving the forward guns of the main-deck battery in a compartment by themselves. The means provided for giving these guns an opportunity for delivering an end-on fire, by the *tumble-in* form given to the sides of the forward part of the ship, is one of the refinements in the construction of ships of war which has been worked out by experience.

Now we propose this ship, this construction throughout, as a suitable model for adoption, with but one reservation, and that is in the *thickness of armor*. Of course, a reduction in the weight of armor will reduce the dimensions of all the parts, and that is just the object that we would have in view; and if we reproduce on a reduced scale such a ship as the "Alexandra," we will have all that we can desire in the shape of an ironclad cruiser. There is no doubt that by reduced length and beam we will have a *handier* ship, and we believe that the reduced thickness of armor will still supply us with a vessel that may be relied on in action, *in all its varying phases*, as capable of giving as good an account of herself as the "Alexandra." Speed is an indispensable requisite that must be secured, and, with this, the simple quality of superior handiness will compensate for inferior capacity for defense by giving increased ability for rapid manœuvring. Of course, the records of target practice do not go to sustain such an assertion, but we take our stand on what we believe would be the effect in action when the circumstances are so dissimilar, and, so far as the experience of sea-fights now supplies us with evidence, we have enough to show that our position is not indefensible. The case of the "New Ironsides" has already been cited, the immunity from casualties of which vessel during the late war was doubly remarkable from the fact that she was always at anchor when in action, and was, consequently, a stationary target for the guns of the enemy.

But the newspapers of the day supply us with additional evidence to strengthen us in the position that we have taken. The contest between the Peruvian light-armored turreted vessel "Huascar" and two heavily-armored broadside Chilean ships of war is a strong evidence of the amount of resistance of which a lightly-armored vessel is capable, and of the protection that is offered by comparatively light covering. The "Huascar" was overmatched from the commencement of

the fight, not on account of her lighter armor, but from the disparity in number of guns, even when contending with the first Chilean vessel which attacked her; but when she was beset by two vessels there was not the slightest chance for her. To continue the struggle against such fearful odds was heroic, but there could be but one termination to such an unequal contest. The same remark will apply to it as was made in reference to the charge of the six hundred, "it is magnificent, but it is not war." The fortunes of war had placed the "Huascar" in a position from which there was no escape, and in which there was no chance of aid. There would have been no loss of honor in surrendering after the arrival of the second attacking vessel, but there seemed to be among the officers a determination that the ship should not fall into the hands of the enemy, and in order to make sure that the victory should be unproductive they were willing to sacrifice the lives of all on board. We read, in one report of the fight, that one of the crew attempted to set fire to the magazine so as to insure the destruction of the ship, but was prevented by his shipmates. In another report we read that, after the flag had been hoisted the second time, when further resistance was impossible, the commanding officer opened outboard valves and was admitting water rapidly into the ship for the purpose of sinking her, when she was boarded and came into the possession of those whose object was to keep her afloat. These circumstances indicate the resolute spirit that there was not to allow the ship to fall into the hands of the enemy, and accounts for the amount of battering which her hull received from the heavy guns of the two Chilean vessels.

In the course of this long-continued firing we read that five shells penetrated the side armor, one raking shot penetrated at the stern, two shots entered the turret (one through a port-hole), while five others were deflected on striking, leaving the mark of their indentation, and the small tower in which the commanding officer was stationed was knocked away.

Now, considering all the circumstances,—the disparity in force, the short range, the steadiness of the object, and the duration of the bombardment,—the result speaks well for the resistance that can be offered by light armor. Her engines and boilers were intact at the end of the engagement, and we do not hear that she was making any water; in fact, in a very few days after she was steaming to Valparaiso. The great destruction of life is an illustration of the destructive effect of shells bursting within the walls of a ship, and in this instance we have the first illustration of the effect of shells from such large pieces of ordnance as were used in this engagement; this explains the otherwise unaccountable destruction of life and the mangled condition in which portions of human bodies were discovered. The effect of the explosion of a shell from a 9-inch Woolwich gun can be conceived when we remember that the bursting charge is eighteen pounds of powder. The

destruction of human life is one of the chief points of interest in this affair, only regarding it as an experiment, as demonstrating the effect of shells, and were it not for this we would be more ready to recognize the immunity from serious injury with which the hull of the "Huascar" came out of action. She steamed off to Valparaiso as soon as her steering-gear was put in order, and the amount of damage that was discovered on her arrival may be very accurately measured by a dispatch published in a daily paper under telegraphic head of November 19, 1879. It says, "A dispatch from Valparaiso, dated October 22, says that the Chileans hope to completely repair the captured Peruvian ironclad 'Huascar' in two weeks." Repairs that can be completed in twice that time cannot be very extensive; the vessel has come out of action in a wonderful state of preservation. The ordeal through which she passed would be considered a severe test for *heavy* armor; it has certainly proved the efficacy of light armor, for had she been *un*-armored, nothing could have prevented her from going to the bottom.

The case of the "Huascar" forms a fitting conclusion to this paper, as being the latest and the best illustration of the soundness of the proposition that we have advanced, and in defense of our call for light armor. The object that we had in view is to draw to the subject the attention of officers of the navy, and, if they are willing to entertain the idea, if it commends itself to their reason, and if they are willing to lend a helping hand, the hope may be entertained that a move may be made to influence the government in this direction, so that we may be supplied with an ironclad fleet not constructed after the fashion of the overloaded ships of Europe, but of a handier class, lightly armored, but capable of doing perhaps as good service in the hour of need. The "Alexandra," which we have set up as a type, or a standard of reference, has a thickness of armor of twelve inches about her water-line; we would reduce this to six inches. The main-deck battery is protected by armor eight inches thick; we would reduce this to five inches. The upper battery is protected by six inches of armor; reduce this to four inches. The thickness of the armor-bulkhead for the protection of the machinery, magazines, etc., is five inches; this might be reduced to three inches. This reduction in weight of armor, which might reach to about one thousand tons, would admit of great modification in the dimensions of the vessel.

As to the battery with which she should be armed, that would have to depend on the tonnage that would result from this reduction in the weights to be carried. At present the weight of the guns in the battery of the "Alexandra" amounts to five hundred and fifteen thousand two hundred pounds, and her tonnage is six thousand and fifty tons. This gives her a ratio of weight of battery to tonnage of eighty-five pounds to one ton, which is far inside the ratio established at the Navy Department. If the changes proposed in the dimensions of the vessel

should result in a reduction of one thousand tons in her tonnage, the present weight of battery would give the new ship a ratio of one hundred and two pounds of gun to one ton of ship, and this is well inside of what we consider a proper proportion to be retained between these factors. The new ship will thus be more appropriately armed, and she will be handier in every way.

I submit this idea, then, to the criticism of the navy. The necessity of armor is recognized; the proposition simply is to reduce the weight of armor, retaining heavy batteries, to let the ratio between offensive and defensive capacity preponderate heavily in favor of the former, the object being to put afloat a fleet of ships with power of offense equal to that of ships with which we would have to contend, but smaller and handier, and yet protected by such thickness of armor as the *experience of war* has shown to be sufficient for the varying phases of sea-fights.

E. SIMPSON,
Commodore U. S. Navy.

NEW LONDON, December, 1879.

FEEDING A GREAT ARMY.

On May 4, 1864, the Army of the Potomac left Brandy Station, on the Rappahannock River, near Culpeper, Virginia, for the campaign during which were subsequently fought the battles of the Wilderness, Spottsylvania, Cold Harbor, and others. The base of supplies for this army had, during the winter, been at Alexandria, Virginia, some fifty miles distant by rail. When the army began its march across the Germania Ford its strength aggregated about one hundred and fifty thousand souls, including the corps of Major-General Burnside, which was to follow the main army in a few days. It was intended that the troops should cut loose from their base of supplies, and it was estimated that rations must accompany them to last for some sixteen days, or until such time as they would be enabled to draw from a new base to be established in the vicinity of the position which the army was expected to take up before these supplies became exhausted. I was sent for by Major-General Meade, commanding the Army of the Potomac, and directed to arrange for the subsistence supplies for the army accordingly.

The soldiers were required to carry in their knapsacks three days' rations, and also in their haversacks three days' rations of hard bread, coffee, sugar, and salt; issues of these articles from the supply-trains to be made to the men every two or three days, when practicable, so that at no time would a soldier have on his person less than from three to five days' rations of them. The supply-trains were required to carry ten days' rations of the same articles, and one day's rations of salt pork. It was also ordered that the remainder of the meat ration should be provided in beef-cattle on the hoof, to be driven along with the troops, but not to occupy any roads used by the latter, and thus interfere with the march of the soldiers, and that an aggregate supply of beef-cattle on the hoof for thirteen days' rations be so driven.

Some idea of the length of the wagon-train which it was requisite should accompany the army during this campaign may be formed when it is known that, after containing the subsistence stores above mentioned, the ammunition, the necessary forage for the animals, and clothing required to replace that worn out during the march, this train, had it been placed in a right line, when the first wagon was entering

the city of Richmond the last one would have been just leaving the city of Washington,—a distance of about one hundred and thirty miles by rail.

Together with the immense herd of beef-cattle kept at Brandy Station for the current needs of the army, I found that, to carry out my orders of supply, it would be necessary to have sent up to the front from Alexandria, some fifty miles distant, about six thousand head of beef-cattle, with the forage, corn in the ear and hay necessary to subsist them until the march began, and this feat had to be accomplished between one Friday morning and the following Tuesday night; or, in other words, to arrive in time and for the purpose needed, an average of twelve hundred head of beef-cattle had to be sent me daily for five days, with the necessary forage for their maintenance.

The existing capacity of the Orange and Alexandria Railroad in cattle-cars was, at this time, for about only three hundred head daily. I telegraphed to Alexandria to know whether the number of cattle required *could* be sent up. The reply was that "*they must be sent up.*"

This sudden call and the subsequent remarkable feat of shipping six thousand cattle over this road of a single track, in the time required and with its limited resources, was accomplished by the authorities seizing all the flat cars within reach, and placing fences around them; also, all the freight-cars that could be obtained, and removing portions of their sides for ventilation. In this manner eighteen hundred head were sent up in one day of twenty-four hours. At one time during the shipment an endless chain of cattle-cars was in transit, most of the railroad sidings being filled with them, and as a passenger or freight train would pass a station and a siding, the trains of cattle-cars waiting thereat would be pushed forward to another one. We received all the cattle asked for before the time needed.

Three hundred men were kept constantly employed in unloading the cattle-cars on their arrival at the front, so that the emptied cars might be sent back without delay.

During the march, the movements of the cattle were so arranged that the number corresponding in the meat ration to the number of days' rations of hard bread, coffee, sugar, and salt in the men's haversacks, *should march as a unit of a brigade organization;* the number for the same purpose to constitute the meat ration corresponding with the number of days' rations in the soldiers' knapsacks, were marched as a *division unit;* sufficient for the remainder of the meat ration were driven as a corps herd organization. In addition to these, there was a general herd provided as a reserve, upon which drafts could be made, when necessary, to replenish the corps herds.

During this campaign Major-General Meade, commanding the Army of the Potomac, required the chief of each supply department to be present near his person all the time. He also required reports

from them, whenever he thought proper to do so, as to the status of supply in all particulars, at the moment when he might make a demand for such information, which the chiefs of the staff departments were enabled to furnish him from reports received twice daily from each corresponding chief of the department of a corps, so that at any moment, when he or General Grant, in command of the armies operating against Richmond, desired to know the status of the subsistence supply of any brigade, division, or corps of the Army of the Potomac, with a view to its detachment, or for any other purpose, the Chief Commissary of Subsistence was enabled to give it on the spot when called upon.

The following exhibits the organization of the subsistence department of the Army of the Potomac during the campaign from Brandy Station, Virginia, to Petersburg, Virginia, the army leaving its camps on the 4th of May, 1864, as before stated, and on June 16, 1864, the commanding general and staff reached the fortifications of Petersburg.

ORGANIZATION.

On the opening of this campaign the Army of the Potomac was organized in the following corps and independent commands, viz.:

Second Army Corps, Fifth Army Corps, Sixth Army Corps, Cavalry Corps, Artillery Reserve, First Brigade Horse Artillery, Second Brigade Horse Artillery, Regular Engineer Battalion, Volunteer Engineer Battalion, Provisional Brigade (Provost-Marshal-General), and subsequently attached to this army were the Ninth Army Corps, and during the campaign the Eighteenth Army Corps.

The Second Corps was organized as shown in the list following, which also exhibits the organization of the subsistence department of that corps:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
2			J. S. Smith,	Lieut.-Col. and C. S.	Chief C. S.
	1		A. C. Voris,	Capt. and C. S.	Chief C. S. Div.
		1	R. W. Thompson,	" "	
		2	C. S. Langdon,	" "	
		3	L. L. Rose,	" "	
		4	G. P. Burnham,	" "	
	2		T. S. Cromberger,	" "	Chief C. S. Div.
		1	F. W. Owen,	" "	
		2	G. B. Corkhell,	" "	
		3	W. A. Nicholls,	" "	
	3		C. M. Rabius,	" "	Chief C. S. Div.
		1	G. W. Cooney,	" "	
		2	D. C. Tomlinson,	" "	
	4		C. J. Queen,	" "	Chief C. S. Div.
		1	G. W. Beach,	" "	
		2	J. N. Comstock,	" "	
Artillery Brigade,			J. T. Elliott,	" "	

This corps, before the conclusion of the march, underwent reorganization by the addition of troops assigned to it; the Fourth Brigade, Second Division, was created. Captain B. F. Weeks served as commissary of the brigade.

The Third and Fourth Brigades, Third Division, were created. Captain J. H. Parkham, Sixth Massachusetts Volunteers, served with the former as acting commissary of subsistence of the brigade, and Captain J. Crawford acting commissary of subsistence with the latter.

The Fifth Army Corps was organized as exhibited in the following list:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
5			D. L. Smith,	Capt. and C. S.	Acting Chief C. S.
	1		M. R. Came,	" "	Chief C. S. Div.
		1	E. W. Warren,	" "	
		2	W. T. W. Ball,	" "	
		3	G. W. Weir,	" "	
	2		F. Gerker,	" "	Chief C. S. Div.
		1	N. Mayhew,	" "	
		2	B. F. Bucklin,	" "	
		3	W. L. Kenly,	" "	
	3		P. B Spear,	" "	
		1	J. D. Adair,	" "	
		2	J. S. Burdette,	" "	
	4		C. McClure,	" "	Chief C. S. Div.
		1	H. C. Halloway,	" "	
		2	A. Walker,	" "	
		3	W. E. Rathbone,	" "	
Artillery Brigade,			S. R. Steele,	" "	

The organization of the Sixth Corps is exhibited in list below:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
6			J. K. Schofield,	Capt. and C. S.	Acting Chief C. S.
	1		J. G. Fitts,	" "	Chief C. S.
		1	E. S. Converse,	" "	
		2	W. J. Campbell,	Lieut. 91st Pa. Vols. and A. C. S.	
		3	W. D. Wasson,	Capt. and C. S.	
		4	W. R. Hedden,	Lieut. 65th N. Y. Vols. and A. C. S.	
	2		C. C. Morse,	Capt. and C. S.	Chief C. S. Div.
		1	H. B. Masters,	" "	
		2	A. B. Valentine,	" "	
		3	G. F. Burroughs,	" "	
		4	W. J. Ellis,	" "	
	3		E. M. Buchanon,	" "	Chief C. S. Div.
		1	D. H. Veach,	" "	
		2	H. L. McKee,	" "	
Artillery Brigade,			L. W. Muzzy,	" "	

The Cavalry Corps was organized as follows:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
Cav.			G. W. Woods,	Lieut.-Col. and C. S.	Chief C. S.
	1		M. F. Hale,	Capt. and C. S.	Chief C. S. Div.
		1	C. Brewster,	" "	
		2	W. Thompson,	" "	
		Reserve,	P. Dwyer,	Lieut. 5th U. S. Cav. and A. C. S.	
	2		P. Pollock,	Capt. and C. S.	Chief C. S. Div.
		1	J. N. Potter,	" "	
		2	G. W. Eddy,	" "	
	3		G. J. Taggart,	" "	Chief C. S. Div.
		1	J. D. Earle,	" "	
		2	N. S. Shannon,	Lieut. 3d Ind. Cav. and A. C. S.	

The organization of the Artillery Reserve was as follows:

Command.	Brig.	Name.	Rank.	Remarks.
Art. Res.		B. F. Talbot,	Capt. and C. S.	Chief C. S.
	1	H. Smith,	Capt. 6th H. Art. and A. C. S.	
	2	D. Tarbell,	Capt. and C. S.	
	3	M. Bayliss,	" "	

The following officers were serving as commissaries or acting commissaries with the several independent commands, respectively, viz.:

With 1st Brigade Horse Artillery, Capt. H. L. Crawford, C. S.
With 2d Brigade Horse Artillery, Lieut. W. M Mayndier, 1st U. S. Art., A. C. S.
With Reg. Engineer Battalion, Lieut. W. H. Benguard, Corps Engineers, A. C. S.
With Vol. Engineer Battalion, Lieut. G. Templeton, 50th N. Y. Engineers, A. C. S.
With Provisional Brigade (Prov.-Mar.-General's Dept.), Capt. H. P. Clinton, C. S.
With mis. troops, etc., Headquarters Army of the Potomac, Capt. J. R. Coxe, C. S.

The Ninth Army Corps was attached to the Army of the Potomac during the march, and on May 25 its chief commissary of subsistence was directed to report to the chief commissary of subsistence of the army. On the 27th of May the organization of that corps was reported to the chief commissary of subsistence of the army to be as follows:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
9			E. R. Goodrich,	Lieut.-Col. and C. S.	Chief C. S.
	1		J. Justin,	1st Lieut. 100th Pa. Vols. and A. C. S.	Chief C. S. Div.
		1	S. B. Tobey,	1st Lieut. 3d N. Y. Vols. and A. C. S.	
		2	J. B. Goodrich,	1st Lieut. 21st Mass. Vols. and A. C. S.	
		3	P. H. Hedges,	1st Lieut. 14th N. Y. Art. and A. C. S.	
	2		J. H. King,	Capt. and C. S.	Chief C. S. Div.
		1	S. Fessenden,	1st Lieut. 7th R. I. Vols. and A. C. S.	
		2	J. H. Varney,	1st Lieut. 6th N. H. Vols. and A. C. S.	

3		J. H. Coale,	Lieut.-Col. and C. S.	Chief C. S. Div.
	1	R. D. Johnson,	Capt. 2d Mich. Vols. and A. C. S.	
	2	A. Jones,	1st Lieut. 50th Pa. Vols. and A. C. S.	
4		A. Gregory,	Capt. and C. S.	Chief C. S. Div.
	1	E. F. Emory,	1st Lieut. 36th Mass. Vols. and A. C. S.	
	2	B. H. Stile,	1st Lieut. 25th U. S. C. T. and A. C. S.	

The Eighteenth Army Corps was attached to the army a day or two before the battle of Cold Harbor, and on June 1 the chief commissary of subsistence of the corps was directed to report for duty to the chief commissary of subsistence of the army.

The organization of the Eighteenth Corps was as follows:

Corps.	Div.	Brig.	Name.	Rank.	Remarks.
18			J. Hall,	Capt. and C. S.	Acting Chief C. S.
	1		G. C. Wetherby,	" "	Chief C. S. Div.
		1	J. H. Wilkinson,	2d Lieut. 2d N. H. Vols. and A. C. S.	
		2	H. J. Spooner,	1st Lieut. 4th R. I. Vols. and A. C. S.	
		3	C. O. Hubbel,	1st Lieut. 92d N. Y. Vols. and A. C. S.	
		4	P. Riley,	1st Lieut. 10th N. Y. Vols. and A. C. S.	
	2		M. A. Hill,	Capt. and C. S.	Chief C. S. Div.
		1	J. H. Fowler,	1st Lieut. 27th Mass. Vols. and A. C. S.	
		2	S. S. Reeder,	1st Lieut. 148th N. Y. Vols. and A. C. S.	
	3		R. Holmes,	Capt. and C. S.	Chief C. S. Div.
		1	J. M. Avery,	1st Lieut. 48th N. Y. Vols. and A. C. S.	
		2	J. H. Musser,	Capt. and C. S.	
		3	H. Holmes,	" "	

The following officers were under the immediate direction of the chief commissary of subsistence, Army of the Potomac:

OFFICERS OF DEPOT ORGANIZATIONS.

Captain D. D. Wiley, C. S.
Captain G. L. Ames, C. S.
Captain J. Benedict, C. S.
Captain G. F. Thompson, C. S.
Captain L. W. Smith, C. S.
Captain J. Y. England, C. S.

OFFICERS OF THE GENERAL CATTLE-HERDING PARTY.

Captain J. H. Woodward, C. S.
Captain M. R. Murphy, C. S.

To every officer of experience in the army the preparatory orders for its subsistence supply were indicative of a long and fatiguing march,

with the prospect of separation for a considerable time from a base of supplies. No one knew the plans of the campaign, but circumstances pointed to an overland route to Richmond. Preliminary instructions, such as the circumstances demanded, were given by the chief commissary of the army admonishing caution, promptness, and system to insure success in the subsistence department during the impending campaign.

Feeling that upon the efficiency of the subsistence department the comfort of the soldiers depended, and with a knowledge that men cannot fight without food, and that a failure to comply with orders in a single instance might result in a failure of some important movement of the army for want of supplies, the responsibilities of the situation became apparent. To guard against a failure at the outset of the march, it was required that all the stores intended for supply be drawn at once, or as soon as the depot commissary at Brandy Station could furnish them, and that all stores be thoroughly inspected to prevent any unsound articles being taken, and thus remove by timely action a troublesome and serious cause of complaint.

The next difficulty that presented itself was the subject of transportation for the ten days' supplies ordered to be carried in the supply-trains, the number of wagons being limited, and each corps was required to estimate for the exact number of wagons required, and that they be loaded to their utmost capacity. Each wagon was also required to carry five days' rations of forage for the animals, thus lessening the capacity of each wagon by six hundred pounds. In addition to the forage carried it was estimated that each six-mule wagon should carry two thousand four hundred pounds gross of subsistence. A convenient mode of packing the wagons was found to be as follows: hard bread, forty boxes in each one; pork, six barrels; and coffee, four barrels, making ten barrels in the wagon. Sugar, ten barrels. Salt was distributed through the trains by displacing one barrel of sugar or coffee and inserting one sack of salt. The trains moved by divisions, the supplies of each train being under the immediate charge of a division commissary, whose duty it was to remain at all times with his train.

The posts of the brigade commissaries were required to be at the front at the headquarters of their respective brigades; the post of the chief commissary of each corps being at the headquarters of their respective corps commanders. Experience in former campaigns had shown that this system was the best in subsisting an army on an active campaign, and its effectiveness was fully demonstrated on the 26th of May, when the army was in position on the south side of the North Anna River, the trains being at Milford, fourteen miles distant from headquarters, when, at 12.30 P.M., an order was issued from army headquarters requiring each corps and independent command to at once send to their supply-trains for four days' rations, to be issued the same night,

so that on the morrow the troops would have six days' rations upon their persons. By 9 P.M. the same night the troops were rationed as ordered. Had the chief commissary of subsistence of any of the corps not been at corps headquarters, the division commissaries not with the trains, or the brigade commissaries not with the troops, serious delays and inconvenience would have ensued, as some of the corps had no communication with the supply-trains for several days after the movement.

On the 8th day of May, and after the battle of the Wilderness, a special order required five days' rations to be issued to the entire army, and that the empty wagons be sent back to Fredericksburg to be reloaded. On this day an officer reported that some eleven hundred wounded men in the abandoned field hospitals were suffering for the want of food, the rations supplied them when the army moved having been taken by the rebel cavalry and stragglers; an order soon afterwards required supplies to be sent for their relief, and under flag of truce if necessary. Three thousand rations were accordingly so sent, and the officer with his little train reached these men beyond our lines in the afternoon; a few rebel stragglers were in the camp pilfering what they could lay their hands on. These wounded men were famishing with hunger, having had nothing to eat for three days. Those who were able had gathered the refuse of the camp and culled from it a scanty subsistence; when informed that rations had reached them by the order of the commanding general, many of the brave fellows were so overcome that they wept, and from their glad hearts they expressed a joy that knew no bounds. The next day a division of the Second Corps was sent back, and succeeded in removing all our abandoned hospitals, wounded men, and stores.

On the 11th of May special orders from army headquarters required that five days' rations be issued at once to the troops of the whole army, including one day's rations of salt meat, and that all empty wagons be sent with as little delay as possible to Belle Plain, where a subsistence depot had just been established, there to be reloaded to their maximum capacity with supplies for the army, three days' salt meat to be included among the supplies drawn. An officer of the subsistence department was detailed from each corps to proceed with the wagons and draw the supplies for his corps; this officer's duty was to draw all stores for the corps, have the wagons loaded by divisions, and send to the division commissaries at the main train such supplies as they had estimated for.

On the 13th day of May another issue was made to the troops, and the empty wagons sent to the depot at Belle Plain to be reloaded. The rations issued on this day made the supplies in the hands of the troops up to and including the 19th of May.

On May 16, and during the series of battles in the vicinity of Spottsylvania Court-House, on the recommendation of the chief com-

missary of subsistence of the army, an order was issued requiring each corps commander to detail a lieutenant from each division of his command to be charged with the duty of supplying the hospitals of his division the subsistence it needed. This order materially facilitated the issue of hospital supplies.

On the 20th of May the army moved from the front of Spottsylvania Court-House, and crossed the North Anna River on the 21st. The trains withdrew from Fredericksburg, and the depot at Belle Plain was broken up, and a new temporary depot was established at Port Royal, on the Rappahannock River, a distance of thirty miles from the army; the supply-trains were packed at Milford, about fourteen miles from the army. On the morning of May 20 the troops had on their persons four days' rations. The division supply-trains had eight days' rations for the army.

On May 31, the depot was removed from Port Royal, and one was established at the White House, Virginia, and the empty trains were sent to that depot for supplies.

On or about the 2d of June, and just before the battle of Cold Harbor, a new army corps joined the Army of the Potomac at its position in the field and away from the depots, and I was directed to see that their immediate necessities were provided for, the corps not having supplied itself to any extent on leaving the "White House" depot. We were enabled to give this relief, and for that purpose eighteen thousand rations of hard bread, sugar, coffee, and salt, and thirty-seven head beef-cattle were sent from the trains of one of the corps. These supplies so furnished had been hauled fifty miles in the wagons of the train; these wagons were immediately sent back to the depot to be replenished. During the campaign, and whenever possible, I had arrangements made by which, if the troops were not to move for a few days, the stores in the wagons were emptied upon the ground, and the empty wagons sent rapidly to the depots to bring up potatoes, onions, and antiscorbutics, and I have heard the troops in line of battle cheer the subsistence department as the barrels of the vegetables were rolled into the trenches and their heads knocked in.

On June 4 three days' rations were issued to the troops, making on their persons five days' rations from June 5.

On June 7 two additional days' rations were issued.

On June 9 two days' rations were issued.

On June 10 an order was issued requiring that four days' rations be kept in the hands of the men, and six days' in the division supply-trains, and the wagons not required to carry these stores be used to carry to the troops "antiscorbutics," fresh vegetables, etc.

During the entire march rations were required never to be drawn from the main trains unless ordered from the headquarters of the army, except for immediate issues to hospitals, or to relieve troops who had

lost their rations in action, or who joined their commands from the hospitals.

To the system adopted by the chief commissary of subsistence of the army, in having the amount of rations in the hands of the troops and in the division supply-trains reported regularly to him, and a uniform system of issues, it is thought there can be attributed some of the success and credit due the subsistence department during this campaign.

In addition to the regular field rations issued, large quantities of soap, vinegar, flour, pepper, pickles, dried apples, potatoes, onions, etc., were brought forward for sale to officers for hospitals, and for issues to the troops generally, the wagons, as mentioned above, being utilized for this purpose, when it was safe to empty them temporarily of their regular supplies, and send them to the depots to be filled with these articles.

When the Army of the Potomac reached the James River, it crossed upon the pontoon bridge thrown across that river, below and near City Point, Virginia, and the army began its investment of Petersburg, Virginia, about the 16th of June, 1864, with its base of supplies at City Point, and the task of supplying that army during the march *ceased*, the depot of supplies being very near and accessible to the position it then held.

Some idea may be formed of the immense quantities of food necessary to sustain a great army from the following statement, made up from reports received by me from the subsistence departments of supply.

I find that between May 1, 1864, and June 3, 1864 (the two months during which the above campaign was being conducted), there were drawn from the various depots established,—

1,003,400	rations	pork.	726,000	rations	candles.
10,419	"	bacon.	1,298,000	"	soap.
234,832	"	ham.	4,043,540	"	salt.
40,477	"	flour.	410,787	"	whisky.
3,881,225	"	hard bread.	832,617	"	pepper.
4,214,313	"	coffee.	535,840	"	dried apples.
161,867	"	tea.	139,200	"	pickles.
4,652,189	"	sugar.	416,533	"	pickled cabbage.
299,200	"	vinegar.			

And during this whole period, with the exception of some fifteen days, the troops were constantly marching and fighting.

The following antiscorbutics were issued to the Army of the Potomac during the eleven months anterior to this campaign, viz., from February 1, 1863, to December 31, 1863, and during much of this time the troops thus supplied were engaged in campaigns at times of great length and importance, during which they subsisted principally upon articles of the marching ration alone:

ANTISCORBUTICS.

Flour	13,928,922 rations.	Fresh turnips	374,844 rations.
Corn-meal	77,177 "	Fresh carrots	49,119 "
Potatoes	38,888,108 "	Fresh parsnips	9,428 "
Onions	5,091,447 "	Desiccated vegetables.	1,034,948 "
Dried apples	6,181,736 "	Desiccated potatoes	212,659 "
Dried peaches	280,043 "	Pickles	730,000 "
Fresh beets	804,044 "	Fresh cabbage	669,810 "

The writer has prepared this article with diffidence, and only upon the solicitation of the editors of THE UNITED SERVICE. The nation acknowledges with gratitude the unrequitable debt which it owes to its brave defenders, who imperiled or lost their lives in its defense when its existence was at stake; and if this article will but serve to show that those who nobly, but quietly, labored to supply the fighting element of the army with subsistence—without which fighting and ultimate victory would have been impossible—merit some share of the national gratitude, he will feel that what he has written will not have been written in vain.

COMMISSARY OF SUBSISTENCE.

A CHAPTER OF MYTHOLOGICAL ASTRONOMY.

PART II.

DRAPER, in his chapter upon the Primitive Opinions of Man, traces the outgrowth of the mind from its lowest conditions of superstition. "In the intellectual infancy of a savage state," he writes, "man transfers to nature his conceptions of himself; and, considering that everything he does is determined by his own pleasures, regards all passing events as depending on the arbitrary volition of a superior but invisible power. In the distance and irresistible motion of the stars he finds arguments for the supernatural, and gives to each of those shining bodies an abiding and controlling genius. But as reason led him forth from fetichism, so, in due time, it again leads him forth from star-worship. Philosophically speaking, he is exchanging by ascending degrees his primitive doctrine of arbitrary volition for the doctrine of law."

The evidence yielded by exploded astronomical beliefs proves this genesis, this outgrowth and progression; and to our cruelly cynical days the speculations, the beliefs, nay, the pious hopes, of the earliest star-gazers seem as the phantasmagoria of a dream. It was seriously declared by some philosophers that there were no actual visible suns, planets, nor stars, but what we saw were reflections from an immense light under the earth's plain. Savage races imagined that when the moon decreased it broke into stars, being renewed each month after a season of sorrow by a special creative act; and the Indians believed it was filled with nectar, which the high gods ate when the luminary waned, and which grew again when it waxed,—an exceedingly economical confectionery-shop for those feasts that Homer has made so realistic. The Brahmins placed the earth in the centre of a sea of liquid, wherein the other bodies swam; they counted nine planets, of which two were invisible dragons causing eclipses; and as these phenomena occurred in different parts of the zodiac, it proved that the dragons revolved with their unfortunate victims. Venus was two planets, Hesperus and Phosphorus, according as it rose and set. The sun was thought to be nearer than the moon, because it was hotter and brighter; and Berosus the Chaldean, who turned the observations of Bel into Greek, explained

the phases and eclipses of the moon on the assumption that on one side it was illuminated and on the other were the shifting tones of our sky, and in turning it displayed the different colors to us. Anaxagoras, 450 B.C., had all manner of odd beliefs; to him the heavenly bodies were fragments of rocks, which the ambient ether, by the force of its circular motion, had detached from the earth, kindled, and turned into stars; and he believed conscientiously that the sun was a mass of fire larger, perhaps, than Peloponnesus; and that the earth had been carried to the centre of the universe by a whirlwind, the pole having been originally in the zenith. The Ionic school placed aerolites and stars in one class and assigned them all a terrestrial origin.

The Milky-Way was supposed to have been caused by a star which escaped from Phaeton while he was lighting the celestial theatre, and in its unexpected but harmonic flight set fire to the space passed over. Others saw in it the circle in which the sun was moving at the creation of the world, and still others declared there was no material milky-way, nothing, upon their words, but a simple optical phenomenon like the effect we see in rainbows. Parmenidas claimed that its color arose from a mixture of dense and rare air; and the same Anaxagoras believed it to be the effect of the earth's shadow projected upon that part of the heavens when the sky was below; and so through fifty different absurd beliefs, until we come to Theophrastus, who taught it was merely the junction of the two hemispheres forming the vault, and such a very bungling junction, too, that some of the light, which he supposed everywhere on the other side, escaped through the crack. The Greeks called it the Galaxy, the Chinese and Arabians the River of Death, and the North American Indians the Path of Souls. We now know it to be an agglomeration of suns, itself a nebula, a mass of sidereal systems with our own sun among them, since our sun is a single star in this vast archipelago of eighteen million orbs.

641 B.C., Thales of Miletus thought the stars were of the same substance as the earth, only they were on fire; Plutarch believed the sun to be a burning stone; and Diogenes Laertius looked upon it as hot iron; Heraclitus considered it to be a foot in diameter and a mere meteor, like all the other heavenly bodies; Empedocles, who went into the crater with the spirit of a modern interviewer, and whose hopes to figure as a translated god were frustrated by the appearance of his brazen sandal, declared that the true sun, the fire that is in the centre of the universe, illuminated the other hemisphere, and what we saw was only the reflected image of this true one, which, though invisible, governed the light and movements of our ancillary luminary. Philolaus, his disciple, taught that the sun was a mass of glass, which sent us by reflection all the light scattered through the universe. Xenophanes was as extravagant in fancy as he was economical in practice; he showed that the stars were lighted every night and extinguished

every morning by the celestial corporation; that the sun was a fiery cloud; that eclipses were due to the sun's being first extinguished and then rekindled; that the moon was inhabited and eight times larger than our earth, and that there were several moons and suns for giving light to different countries. This matches the profound wisdom which proves that the sun steals to the east through a hole under the earth, or that it returns above ground unnoticed, because the journey is made in the night. Plato said the earth was the oldest and the first of starry bodies, and that it remained balanced in the centre of the universe by its own equilibrium; and he thought it might possibly be a generated god and an ensouled being. In the Koran Mahomet declared that the earth was firmly balanced in its seat by the weight of mountains; that the sky was supported over it like a dome, and that we may learn the wisdom and power of the only God by our failure to find a crack in the superstructure. The Prophet recognized seven heavens, the highest supported by winged animal forms; to him the shooting-stars were pieces of red-hot stone thrown by angels at impure spirits; and in the resurrection the sun, after being extinguished, will be relighted and rise in the west; and when the partition is made it will approach within a mile and melt the bodies of the wicked. Anaximas, believing the stars to be for ornament, affirmed they were buttoned like gold studs to the firmament; and Callimachus describes the circumpolar stars as feeding on air; while others, trusting in the extra-universal glow of Theophrastus, thought the stellar orbs were *spiraculæ*,—breathing-holes of the universe. The Hindoos inculcated the doctrine that a certain Mount Meroo was the centre of the world. This was cone-shaped, with a jeweled surface, and supported on its apex a terrestrial paradise; it was surrounded by seven concentric belts of habitable lands divided from each other by seven oceans; India dominated the central belt, the others being separated by seas of milk, wine, and molasses. Flores wrote that Decimus Brutus paused in his conquest of Spain because in that Ultima Thule he witnessed the descent of the sun into the ocean, and heard, affrightedly, the terrible noise occasioned by its daily extinction; and these same Iberians were afterwards ridiculed for believing that they heard each night the hissing noise made by the burning sun as it was cooled, like a hot iron, in the waves of the ghostly sea.

The Egyptians personified the sun by depicting it as a male of different ages, according to the season represented; a survival which we have in pictorial almanacs, except that in Egypt it was painted as an infant at the winter solstice, as a youth at the vernal equinox, as a man of full age, with flowing beard, in summer, and at the autumnal equinox as the hoary individual whom at the end of our year we see Father Time contemptuously directing to Lethe. In the Middle Ages it was currently accepted that the sun and other heavenly bodies were

nourished by equal mixtures of fresh and salt water, and that their feeding-grounds were about the equator; this explained the angular limits of the ecliptic from the necessity of the sun's return to the equatorial commissariat after a limited northern or southern reconnoissance. St. Hilary and St. Theodorus believed that the angels carried the stars upon their shoulders; and other good and sainted men asserted that the seraphim rolled the stars before their materialized bodies,—Riccioli gravely notes that as each angel pushed a star great care was taken to observe the actions of the other celestial laborers, so that the relative distances and intervals were always preserved by a cosmotactical eyes right or left. The Abbot Trimethius gave the exact succession of the delegated governments of the stars by the seven angels of the planets; and not only recorded the order in which the watches were relieved promptly, but with great fairness and without any intercalary dog-watches divided the heavenly log-slate, from the creation until the year 1522, into cycles of three hundred and fifty-four years each. Cyrano of Bergerac had the taste to admire Dante's "Inferno," though not the erudition to appreciate that its division of the hells was due to the influence of the Ptolemaic enumeration of the heavens. He accepted it as an inspired work, and was satisfied that the earth's revolution was caused by the batlike damned grasping unavailingly the infernal ceilings in their attempts at escape. The Eskimo have a tradition that the sun and moon were at the creation the daughter and son of a great chief; one dark night the maiden felt her face touched by the hands of a man, the simple declaration of Arctic love; all uncertain of her swain, she deftly marked his face with oil and soot, and when the lights were brought discovered, as she feared, that the discolored face was that of her love-lorn brother; she seized a taper and, pursued by him, fled wearingly through the starless night, even to the limits of the world. As her brother was about to seize her he stumbled, and she, burning with maidenly blushes, jumped into the infinite spaces, and with her taper flaming before her there revolves forever as the sun. The baffled brother after an interval followed, and through the endless æons as the mournful moon is still pursuing her; when his face is not seen in the night, it is because the portion which the oil and soot discolored is turned darkly towards us.

The uproar made by many savage and half-civilized nations during an eclipse is due to the belief that the moon is fighting with a fierce dragon, and the noise will make him take to flight. In America, the Indians asserted that the sun and moon were tired when they were eclipsed; and the Greeks said that the moon was then bewitched, and that magicians made it descend from heaven to be doctored with herbs that exorcised demons. Comets had a particularly mysterious character for the ancient chroniclers, and they always associated such appearances with some terrestrial event. Bodin wrote that they were the souls of

illustrious personages who were carried in triumph to heaven; and that famines, epidemics, and civil wars followed simply from the natural imbecility of inhabitants who were deprived of the counsel and guidance of the illustrious mortals, *en route* to apotheosis. The popular but false, absurdly false, notion of the Pope's Bull against a Comet, had its origin in the irreverent wit of some practical joker. In June, 1456, while the Pontiff, Calixtus III., was fighting the battle of Christendom with the Saracens before Belgrade, an enormous comet appeared in the heavens. Immediately the theologians showed it had the form of a cross and announced some great event; but the wily Saracen sovereign issued a counterblast, in which the resemblance of the comet to a yataghan was shown, and the certainty that it was a message of good cheer, a blessing from Mahomet, was given; its power would be even as was that of its prototype at Arzriadin, when Kalid, "the sword of God," routed Heraclitus, the Roman, and brought to the Kalifate Antioch, Jerusalem, Tyre, Tripoli, and Aleppo. As surely would victory be theirs, it promised, as when Khalif Omar rode on the red camel, attended by Sophronious the Patriarch, into the Holy City. The Pope, said the small-beer wits, recognized the likeness, and immediately excommunicated the comet with bell, book, and candle; and as a consequence the Christian army gained the day, and made the Infidels question one of their favorite literary maxims, that "the ink of the doctor is equally valuable with the blood of the martyr." We may wonder at the childish credulity of those days of hard knocks and harder marching, but so great a master as Napoleon believed a certain comet to be his protecting genius; and John Milton speaks reverently of the "dim eclipse" which "perplexes monarchs with fear of change." Shakspeare, though, laughs heartily at this "excellent foppery of the world! that when we are sick in fortune . . . we make guilty of our disasters, the sun, the moon, and stars;" and then proceeds to make Edmond berate brother Gloster, "a sectary astronomical," as he calls him, about "these late eclipses that portend no good to us;" and in such vigorous English from the undefiled well, that the proprieties deny the quotation.

The fundamental doctrine of the Pythagoreans that number is "the essence or first principle of things," was applied to the explanation of the origin and development of the universe. Even to this day the mysterious influence of numbers in the most practical affairs, from dining to dying, asserts itself as evidence of the sway the early philosophers yet exert. The superstitious respect which many nations, notably the Oriental, regarded the numeral *seven* probably was due to their inventory of the planets, including the sun and moon, and to the apparent form of the Pleiades, the most important constellation in the primitive scheme. We find the seven superior angels of the theologies of the Chaldeans; the seven gates of Mithra through which all souls must pass to reach the abode of the blessed; the seven worlds of purification

of the Hindoos; and in our own faith, both in the Old and New Testaments, there are striking recurrences of this number in promise and prophecy. Youmans declares that the predominant but false culture of modern times had its origin in a superstition of the Middle Ages, and in a mystical reverence to the sacred number seven, which was supposed to be the key of the universe. That there were seven cardinal virtues, seven deadly sins, seven sacraments, seven metals, seven planets, and seven apertures in a man's head, was believed to afford sufficient reason for making the course of liberal study consist of seven arts and occupy seven years. Following another fancy about the relation of three to four in a certain geometrical figure, these seven arts were divided into two groups. The first three, Grammar, Logic, and Rhetoric, comprised the Trivium; and the remaining four, Arithmetic, Geometry, Astronomy, and Music (the latter as a branch of Arithmetic), formed the Quadrivium. This has been handed down, he asserts, from age to age, and with but slight changes still (1867) predominates in the higher institutions of learning.

Pythagoras imputed great signification to the number because there are seven chords or harmonies; seven pleiads; seven vowels; and certain parts of the bodies of animals change in the course of seven years. Following the relations of the musical octave, this school of mystics placed the planets at distances determined by its crude laws of harmony, and proved the celestial movements through space evoked music, which was unnoticed by us because we habitually heard it. These Pythagoreans believed the celestial spheres had motions which maintained the relations of harmonic numbers, that is, relations proportional to those numbers representing the three consonances they knew. Plato, indeed, claimed that the soul of the universe was composed of two motions, one constant, the other always variable, but so united together in the musical scale that it was possible to formulate from them the rules by which this was governed. This is the famous doctrine of the Celestial Harmony. In his "Republic," Plato, whose obscurity upon this doctrine is proverbial, further teaches there is real harmony between the planets, each of the spheres carrying with it a Siren, and as these *chefs d'orchestre* each sounded a different note, a perfect concert was formed; being immeasurably delighted with their own harmony,—an inherited characteristic of musicians,—they sang divine songs and accompanied them by a sacred dance, thus anticipating the minstrels who invade our decrepid civilization as Tycoons of Harmony and Khedives of Song and Dance. Cicero argued that great motions could not take place in silence, and that it was natural the extremes should have related sounds as in the octave; and therefore the fixed stars trilled ecstatically upon the upper notes and the moon growled musically in the lower register. Kepler, who made his pot boil with astrology, improved upon this with a nice refinement of de-

rision; he cast the grand opera of Cosmos with Jupiter and Saturn as bass, with Mars as the liquid and fascinating tenor, with Venus and Earth as contraltos, and with the modest Mercury as the soprano, the lyric *Diva* for whom the curled and perfumed warrior sighed. Fanciful as was the amplification of this doctrine, if we substitute "force" for "soul," which was one of its ancient meanings, we can interpret the statement of Timæus to be, that "the distances of the stars and their forces are proportional among themselves to their periodic times."

Among the rudest observers it was evident that the sun followed a fixed path, and to this were assigned different titles; and as the road of the moon was nearly the same, this course could be best studied with reference to the fixed stars nearest the positions which the moon each night relatively assumed. With the Chinese, for example, the zodiac was called the "Yellow-Way," and was divided into twenty-eight parts, known as Nakshatras,—mansions or hotels,—because the moon rested in each a period of twenty-four hours. The Egyptians, Arabians, Persians, and Hindoos had the same enumeration, but with the Accadians, "The Yoke of the Sky" was divided into twelve parts as with us. Whence came the nomenclature of the sky no one can with any certainty tell, but this failure to interpret forgotten lore does not justify the zodiac and constellations being called unmeaning collections of names. Doubtless in every case a history is embodied which the loss or want of knowledge forbids our reading. But the mystery has never been, probably will never be, satisfactorily unfolded; many fanciful interpretations have been offered, but, as Professor Newcomb justly observes, even among those generally accepted, Virgo and Libra are the only two striking ones; because "Virgo, the Virgin, gleaning corn symbolized the harvest," and in "Libra, the Balance, the day and night balance each other, being of equal length." These names were given thousands of years ago, and the signs could not then have been suggested by the seasons, for, owing to the precession of the equinoxes, the zodiacal constellations would not then have corresponded to the seasons apparently indicated. On no better foundation rests the theory that they were intended to represent the twelve labors of Hercules. Among the Jews the Twelve Signs are mentioned in the Book of Kings as being worshiped with the sun and moon; and in the Cabal, the Bull is considered as the first zodiacal sign. It is an odd coincidence that in Joseph's dream, in which the sun and moon and the other eleven stars worshiped him, they are coupled with the various designations given to each son in the blessing of Jacob; and in the Rabbinical lore the number twelve is always retained with great care, and the four chief tribes are represented on their standards by these very signs: Judah, a Lion; Reuben, a Man; Ephraim, a Bull; and Dan, a Scorpion.

An attempt has been made to assign definitely each principal god of the Egyptians to one of the twelve zodiacal signs; and Lucian clearly

says, "It is from the division of the zodiac that the crowd of animals worshiped in Egypt have had their origin." All of this is probably a reversal of the natural process, the fitting of astronomical representations to the deities, or, at the best, is an open question whether the constellations evolved the fables or the fables suggested the constellations. We know the sphere was used two thousand years ago by Hipparchus, and Ptolemy has given a list which embraces forty-eight constellations,—twenty-one northern and fifteen southern, the remaining twelve being situated along the ecliptic. His heaven included one thousand and twenty-six stars, while at present three hundred thousand are catalogued, and the number visible in a large telescope may be reckoned at not less than seventy millions. In the eighth century the Venerable Bede and certain other theologians wished to depose the Olympian gods and substitute St. Peter for the Ram, St. Andrew for the Bull, and so down the roll of saints; and in later calendars the Magi and other New and Old Testament characters were translated to the pictorial skies. In charts of the Middle Ages the Great Bear was replaced by the Barque of St. Peter; the Little Bear by St. Michael; the Dragon by St. Jerome; Perseus by St. Paul; Cassiopeia by the Magdalene; Andromache by St. Sepulchre; the Triangle by the Mitre of St. Peter; and the zodiacal signs by the Twelve Apostles. In the seventeenth century, Wiegel, professor in the University of Jena, proposed to form a series of heraldic constellations, the arms of the twelve most illustrious families of Europe supplanting the menagerie of the zodiac. Poetry, painting, and music have succumbed to Christian influences; but astronomy, like sculpture, is wedded to her pagan loves, and she clings loyally, through doubt and through derision, to the heroes of the Argonaut and to the High Gods of the Fair-Humanities.

It would be impossible in the limits of this article to present the various theories proposed to explain the groupings of the heavens into constellations, or to make evident the analogies that obtain among the most diverse civilizations. The Great Bear, as a familiar illustration, was known in ancient Gaul as Arthur's Chariot; in France as David's Chariot; and in England as King Charles's Wain and as the Plough. Among the Latins it was also designated by this latter name (*Plaustrum*),—the three stars indicating the yoked oxen; and, extending this idea to all, the Romans called the constellation the *septem-triones*, the seven oxen, whence we derive Septentrional, sometimes used for Northern. The Greeks knew it as *Arktos-Megale*, hence Arctic; and, strangely enough, the Iroquois designated it as *Okourai*, the Bear. There is certainly no resemblance to the animal, and it would appear, as Aristotle remarks, that the name was bestowed because, of all known animals, the bear was thought to be the only one that dared venture into the frozen regions of the North. From its slow motion it was also styled the Coffin,—this being represented by

the four quadrilateral stars, the other three being the bearers; and the Christian Arabs saw in it the grave of Lazarus, with the three mourners, Mary and Martha and their handmaiden.

One origin of the names was doubtless the invention of fables to correspond to a previous employment of figurative language; as when a conjunction was called a marriage, a disappearance a death, and a reappearance a resurrection. Coincidences may have been mistaken for causes; and in some countries stars may have given notice of following events, which in other latitudes, from climatic differences and the absence of apparent effects, may have become meaningless. In Egypt the periodical overflowing of the Nile followed the heliacal rising of a certain bright star; this was, in consequence, entitled Anubis, the Monitor or Dog Star, which we still have in Caniculus: "The intimate connection between the rising of this star and the rising of the Nile led people to call it the Nile Star, or simply the Nile; in Hebrew and Egyptian this is *Sihon;* in Greek *Sothis;* and in Latin, whence we get its name, *Sirius.*" The Pleiades had a great influence upon the festivals and calendars of nations, especially in determining the new year. There is an almost universal connection between the rising of this star and the celebration of a Feast of the Dead. The Australians and the Egyptians both solemnized its appearance with a Feast of Ancestors; in the latter country it was dedicated to Osiris, Lord of Tombs; and assumed, as in the former island, the character of a requiem, and like the Corroborees, occupied three days and nights. In India November is known as the month of the Pleiades, and on the seventeenth day is celebrated the "Hindoo Durga," a Festival of the Dead. The Persians called it Mordâd, the Angel of Death, and its feast took place at the same time as a similar commemoration in Peru, which was designated as the Ayamarca; from Aya, a corpse, and Marca, carrying in arms. In the Tongan Islands the Inachi, a renewal of obsequies, was solemnized at the end of October; and in the Society Group, as in Japan and prehistoric England, the 1st of November was filled with mystery. Upon this night the Druids extinguished the sacred fires in the island, and at that signal all lights were put out and a primitive night reigned. Then, with the rustling of unseen wings, the phantoms of those who had died during the year passed weirdly and awfully to the spectral boats that carried them in silence to the Judgment-Seat of the Dead. In the gloom of this night, also, the Druidical nuns were compelled to pull down and rebuild each year their temple's roof, and in silence and in prayer, as a symbol of the destruction and renovation of the world. If one of them let fall the sacred burden of stone she was furiously torn to pieces by her companions; and scarcely a year is said to have passed without its victims. Much of the spirit of the builders of Stonehenge underlies our modern religious celebrations, for in the old English calendars November 1 is

marked "All Saints' Day," and in earlier records the last day of October was "All Hallow Eve," and the 2d of October "All Souls' Day;" a three days' festival, consecrated to the dead, and without doubt originally regulated by the Pleiades among the forgotten progenitors of the human race.

The astronomer has invented instruments which multiply a thousandfold his vision; he has sounded the depths of ether, and gauged the visible universe; he has counted the myriad stars which people it, and studying their complicated movements has measured their dimensions and the distances of the nearest of them from the earth; he has discovered their masses, and in the seeming disorder of stellar groupings has traced real bonds of union; at last evolving order from apparent confusion. He has anticipated the discovery of worlds by calculations of their necessity; he has weighed them, and with the spectroscope has analyzed their chemical constituents, and this by a method so simple that the knowledge of elemental physics makes it plain. Going beyond all this, he has by a supreme flight of thought to the most abstract speculations discovered the laws which regulate their movements and defined the nature of the universal force which sustains them. Much yet remains. What we have hitherto done, all the truth we have gained, amounts "to nothing but some faint glimmers of light shining here and there through the seemingly boundless darkness. Indeed, we see as yet but little hope that an inhabitant of this planet will ever, from his own observations and those of his predecessors, be able to penetrate completely the mystery in which the destiny and structure of Cosmos are enshrined" (Newcomb). But inspired by the deeds of our past, we yearn for that fuller knowledge which was denied the morning of the world; and when we recall what our civilization has effected, we hope, vainly perhaps, that the impossibilities of the present will be the certainties of the future. In the ideas of distances alone, what advances we have made! Hesiod fancied he was giving a grand idea of the distance of the heavens when he said Vulcan's anvil occupied seven days in falling to the earth. We have now determined that if a body were to fall nine days and nights, or 777,600 seconds, under the attraction of the earth, it would traverse but 430,500 miles,—not twice the distance that separates us from the moon, our nearest luminary. A ray of light with a velocity of 184,000 miles a second would pass over this space in less than three seconds, and in a journey from the sun to earth would require only eight minutes; but from one of the nearest of the fixed stars over thirty years must elapse before it would reach us, and coming from a star of the sixteenth magnitude, it would arrive, under the same conditions, upon our planet in 5620 years. In the Middle Ages different results were obtained, for we find one schoolman giving the distances of the planets with the rigorous precision of decimals. In these tables the earth was distant from the sun 3,892,866

miles; from Jupiter 8,323,520 miles; from Saturn 52,544,702 miles; and from the fixed stars 73,387,747 miles. Here the author with great discretion paused, for desiring above all things scientific accuracy, he frankly confessed that his conscience forbade his pursuing the calculation further, as it was impossible for finite wisdom to determine the exact thickness of the ninth or glass heaven. Absurd as all this is, what an improvement upon the Egyptian measurements, that Saturn was 492 miles, the sun 369 miles, and the moon just 246 miles from the earth, the venerable mother of all things!

We may never group into one system the worlds our telescopes reveal, nor demonstrate the necessary relations in which each stands to the other; we may ask in vain if, like our earth, they are inhabited, and like ourselves have a history and tradition. The limitations of our knowledge hold us enthralled earthward, keeping us like children still gathering pebbles on the twilight shorelands of that sea where a grander race to be may fearlessly sail. But even in the majesty and sublimity of a revealed Cosmos our labors will bear testimony to the sincerity, the patience, the genius of our civilization. Poor as these fruits may seem, yet our inheritors will not forget that we substituted truth for falsehood, and in the light of fact and the shadow of speculation opened pathways that broadened luminously into infinities of knowledge. Our progress may have been in the darkened valleys, or at the best upon the dusky foot-hills of the towering mountains; but it will not be forgotten that we occupied, and not ignobly, the middle ground between the night of the myth-makers of a forgotten past and the day of the inspired seekers of a sublimed future.

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U. S. S. "NIPSIC."

ESTABLISHMENTS OF MILITARY EDUCATION IN PRUSSIA.[1]

BY A RETIRED OFFICER OF THE FRENCH ARMY.

AT all times "the solidity of *cadres*,"[2] or, in other words, the degree of moral ascendency and of authority of its *personnel*,—which is proportional to their experience and the ability they have shown,—is one of the surest guarantees for an army. I have already expressed the opinion that in modern armies, composed of young men who enter service without permanently remaining there, the mission of *cadres* becomes of overwhelming importance. To prepare them for such mission is today for nations a primary necessity, for governments an imperative duty. It will require of France a considerable effort, which she has not foreseen. Such effort will entail heavy pecuniary burdens, and will largely increase the sacrifices hitherto made by her. Their principal object will be to multiply and support, *on the footing of carefully-supervised and continually-progressive establishments*, the military schools of different grades, nurseries of the superior and lower *cadres* of the army.

I have demonstrated that France, incessantly troubled as to her national existence by reason of revolutions and wars, has lacked quiet and time to recuperate and to found her military state *upon institutions*, and that she has made good their insufficiency by traditions and legend. This insufficiency, as far as military schools are concerned, is so great and so little acknowledged, that I do not without repugnance enumerate the proofs I have upon this point. I am fitted for this discussion by very vivid and very present recollections of youth; by labors of examination and comparison, to which I devoted myself, during my career in active service, in the performance of special missions; finally, by what I know of the developments which foreign

[1] This article is a part of *L'Armée Française en* 1879, a work published without signature, but credited to General Trochu.

[2] For the information of non-professional readers, it is stated that the term *cadres* is applied to permanent organizations of officers and non-commissioned officers attached to companies or regiments only as far as is needful to shape and unify them. The officers constitute the superior *cadres*, the non-commissioned officers the lower *cadres*.

powers, with persistent solicitude, have given and are daily giving to their establishments of military education. I shall be contradicted by none of our professional men, who have gone to the bottom of things without prejudice, in saying that in this respect we are surpassed by Austria, Russia, Italy (a new military power), and even, all things considered, by some secondary powers who labor successfully, aided by the high degree of public education and instruction which prevails among them, in the reconstitution of their *cadres* with the productions of their military schools. In this regard we are especially behind Prussia, whose situation as to the number of her establishments, the views which have directed their organization, and the results which they give is particularly pre-eminent, and not to be compared with all the others. I give here a sketch, the essential parts of which, drawn from official documents,[3] stops at 1870. Prussia, within eight years, has considerably extended the diverse branches of her military condition, and we can be assured that the following picture represents to-day only the minima.

The Corps of Cadets.

There is first "the corps of cadets," militarily organized in battalions and companies, under the command of a general officer, and scattered over the whole country, *consequently within the reach of families*, in seven different schools, of which one, called the superior school of cadets, is established at Berlin. Their effective force comprises from *fifteen hundred to sixteen hundred pupils.* The great majority of them are of military families, nearly all noble of old, noble or bourgeoise now, and partly aided by the State (there are very few entire scholarships) in the payment of board, which does not exceed two hundred and sixty thalers (about one hundred and ninety dollars). *It is the rule that officers without means, in active service, pay only half.* The studies extend to all branches of instruction, having however as a principal but not exclusive end, the forming of officers. They are peremptorily military only in the upper classes of the school at Berlin, where all the cadets complete their course. These studies last four years in the schools of the provinces. At the complementary school of Berlin they are followed, during two years, by all the pupils; during three years by some (the first upper or *selecta*). The classes are divided into sections, *it being a principle that the work of no professor shall extend to more than thirty pupils.*

It is difficult to conceive of an institution more broadly planned and more liberal from the stand-point of family interests. Although military, it forms for all careers, subjects, who owe to it the benefit of

[3] "Revue militaire de l'Étranger," published by the general staff of the Minister of War.

their first disciplined education. Nearly two-thirds of these families receive, in variable shares, portions of a scholarship, few or no entire scholarships being granted, as I have said, *by virtue of the principle which desires that they should not be entirely disinterested in the work which the State has undertaken to accomplish.* By an assistance so much the more extended from its being the more divided and graduated, it (the State) associates itself with, while refusing to substitute itself for, the family in the effort which it is its duty to make.

It is difficult to imagine an institution whose regulations and methods, in the matter of instruction, are better ordered, as I am about to demonstrate, by following to the end of their scholastic career the cadets (nearly all) who are destined for the army.

Their studies ended at the upper school of Berlin, they are not appointed officers. Before being so, before attaining the first step of command, they have a complete series of proofs to give and tests to undergo. They first present themselves before the superior examining commission, which is in session the whole year at Berlin. Furnished with a certificate of scholarly capacity, they receive the title of *Porte-épée, go to serve six months without real rank in a regiment,* and are after this first test provided with a real and special rank of *Porte-épée Foehnrich,* which answers to that of ensign in the old armies. *They are not yet officers.* To become so they must complete the course *at one of the schools of war,* of which I shall speak hereafter; undergo, after the course, before the superior commission, the officer's examination; obtain through this examination, which establishes their special fitness, the certificate of professional capacity; finally, be the subject, on the part of the subaltern officers of the regiment where they would enter with the grade of second lieutenant, *of a vote which declares their personal honorableness.* The official appointment by the sovereign follows this last test when it has been favorable, *and only if it has been.*

An exception to these rules, applicable to an exceedingly limited number of pupils of the Berlin school of cadets, is made to the advantage of some of the best scholars (*sujets d'élite*). They remain at that school a year longer, following the course of the class called *selecta* if they are first in order of merit, of the class called *first upper* (*première supérieure*) if they are second. After an examination before the examining commission, the former are at once appointed to the grade of second lieutenant *without being voted on by a corps of officers;* the latter appointed *Porte-épée Foehnrich,* serve actively six months and undergo the test of a vote, but are then invested with the grade of second lieutenant *without passing through a school of war.* The advantages which I have just enumerated for this second class are granted, always under condition of examination, *to young foreigners of the corps of cadets who have obtained certain university diplomas.* A singular favor, which can be explained only by the high value which the Prussian State sets on

attracting from all sides into the army young men of recognized merit.

Finally, there are the *avantageurs* who enlist, declaring that they destine themselves for the profession of an officer. They serve as common soldiers with some special privileges, obtain through examination the grade of *Porte-épée Foehnrich*, pass through the school of war, and are promoted to be second lieutenants.

In France there is no career, however elevated it may be, however laden it may be with public responsibilities, on the threshold of which the State has accumulated so many and so diverse guarantees which the candidate must furnish for the advantage of a great national interest, nor so many encouragements of every kind for educated youth to enter therein. To the constant application of these principles, and of these methods of recruiting her corps of officers, Prussia has owed the double advantage of their excellent composition and their superior intelligence. Certain of the worth—established by so many tests—of her subaltern officers, she has been able without peril to promote them upon the score of seniority alone to the grade of captain inclusive. Thus she has suppressed the ambitions, premature, unhealthy, ardent, as they always are in the flush of youth, which set in motion recommendations, patronage, a host of efforts, and sometimes intrigues—destructive plagues of military spirit, of the spirit of companionship, and of the dignity of many officers.

The Schools of War.

There are seven schools of war likewise scattered over the country. They educate from *seven hundred to eight hundred young men*, who are between the ages of nineteen and twenty-four. I have said that the cadets after having ended their studies at the school of Berlin, and their term of active service in the regiments, must pass through the school of war before becoming officers, and that it was the same with non-commissioned officers and soldiers (twenty-three years old, or more) become Porte-épée Foehnrich in the line of the army, through examination, without passing through the school of cadets. *It thus results that all the officers of the Prussian army, whatever may have been the starting-point of their career and their fortune, have been subjected to a common obligation:* 1*st. Examinations* (*the same for all*). 2*d. Studies in the school of war, all having undergone the ordeal of the ranks in the line of the army.*

The course of the schools of war embraces all questions and works relative to the functions of armies, concerning which it is indispensable that an officer—independently of the arm of service to which he goes—should have practice or theory.

I have explained that their studies ended, the pupils of the schools of war were passed upon by the examining commission, which conferred

upon them *the certificate of professional capacity*, the result of which was their appointment to the grade of second lieutenant, upon condition of the favorable vote of their future regimental colleagues. But—a striking particularity—even after good examinations all do not necessarily obtain it immediately. If, for example, their scholastic record is accompanied with the following information, "character uncertain, irresolute, and needs yet to be directed," they see themselves put off until such time as they are deemed sufficiently well-balanced to command.

From all the preceding explanations is evident this particular fact, that the pupils of the Prussian schools of war, having participated in the studies and exercises of all arms, can be considered as fit for all branches of the service, notably and immediately for those of infantry and cavalry. Prussia has, however, at Hanover a cavalry school (military institute of horsemanship), but it is rather normal than special, and is intended above all to educate the detached officers and non-commissioned officers of cavalry regiments and light artillery in practices of horsemanship, which it is their mission to disseminate throughout their corps.

Special Artillery and Engineer School at Berlin.

The artillery and engineer officers graduating like all others from schools of war, and with the same conditions of preparation, receive alone a special complementary course at the artillery and engineer school at Berlin. They enter there without examination with the grade of second lieutenant, upon the choice of the inspectors-general of these two arms. They are full-grown men (twenty-three or twenty-four years old), already long since accustomed to the practice of all military duties, and very quick, through their maturity itself, to appreciate the importance and end of the scientific studies and special works to which they are set. The course lasts twenty-one months, and ends with examinations, after which these officers are definitively admitted into these two educated arms of the service. What an intelligent and solid recruiting of specialists! Is it necessary to dwell upon the advantages which Prussia derives from such military education and instruction, *generalized before being specialized*, which it gives in its schools of war to young officers of all arms? Common tuition, common principles, common spirit, cemented by school fellowship, nothing is wanting to make them very adherent and solid parts of all which they are destined to renew.

The War Academy at Berlin.

The object of the *Academy of War* (superior school of war) is, according to the Prussian regulation, "to initiate in the higher branches

of the art of war capable *officers of all arms* who are desirous of perfecting their education and cultivating the talents which they have already developed in service. They may acquire thus the necessary qualifications for service in the staff, for the *adjudantur* (military staff-duty by detached officers), and for military commands of high rank."

Admissions to the Academy of War are consequent on examinations covering varied and difficult subjects, eligible candidates for which are those who, having served three years as officers, are proposed *ad hoc* by their chiefs. They must fulfill a series of rigorously-defined conditions, among which may be noticed the two following:

To have given proof of a decided character.

To be in an unembarrassed condition as regards money matters.

Besides, all must present a *curriculum vitæ* written in German and French. It is a kind of autobiography of the candidate, setting forth the condition of his family, his religion, the succession of his previous studies, the establishment where they were made, the German, *French*, and Latin authors which they have studied and translated; indeed, all the circumstances which have influenced their education and the commencement of their career.

These details, which I abbreviate, are characteristic of the spirit which presided over the creation of this institution, aged to-day in Prussia over half a century,—it dates from 1816.

The course lasts three years. Theoretically and practically it embraces all the positive sciences which directly or indirectly are the auxiliaries of war. It even extends—*but optionally*—to transcendental studies, such as differential and integral calculus, applied mechanics, geodesy, the general history of literature, etc. The course ends by works of application of all kinds carried on according to judiciously graded programmes.

The three years' studies ended, new examinations class the officers of the Academy of War in order of general merit, and specialize them in regard to their aptitude. *This document is kept secret.* They return to their regiment, there to be at the disposal of the department of war, in an enviable and envied position, but without any particular right. They become the nursery of officers for the general staff of the army, of the *adjudantur*, of officers sent on special duty, put in charge of instruction in military schools, etc.

By this rapid sketch it can be seen that for officers of merit the Prussian Academy of War is a powerful instrument of emulation, as well as of education in all the directing functions of war, or those auxiliary to its direction; that it is for the whole army the centre of a very elevated plane of instruction, *a kind of conservatory of the higher studies of war*, where subjects highly gifted and already proved are moulded, many to become in the army the general disseminators of great principles and of science, some to command it.

Schools for Non-commissioned Officers.

This entire system of military institutions, commencing at the schools of cadets and, passing through the intermediate schools I have enumerated, ending at the Academy of War, has as an object the formation and support of the superior *cadres*. The views which have directed this strong organization of Prussian military education, secondary and superior, should extend to the organization of a primary education destined for a like formation and support of the inferior *cadres*. It is with this end in view that the schools of non-commissioned officers have been instituted.

They numbered six in 1870, each forming a battalion of four companies.[4] Three years are devoted to these studies,—studies primary as regards general instruction; as regards military instruction, special and limited to details of service, the pupils not pretending to the epaulette as the end of their career. This situation of non-commissioned officers in Prussia is not, as we generally believe, the effect of illiberal tendencies in Prussian law and custom. It is the logical result of the fundamental rule, invariably applied to replenishing the corps of officers and so fertile in decisive results upon the management of war, which requires that all aspirants to the epaulette, whatever may be their origin, shall give proof of a complete preparatory instruction by a series of strictly impartial examinations.

Everywhere in Europe to-day it is very difficult to retain in the army material capable of forming good inferior *cadres*. This is especially felt in Prussia, where the regulation, well conceived in the interest of *cadres*, but nearly impossible of application to-day, traditionally wills that the grades of non-commissioned officers shall be conferred upon privates and corporals (*hommes des troupe*) only after three years' service,—that is, at the moment of their discharge. The radical changes wrought in social life by the developments of commerce and industry, by the diversity of occupations which they offer to all kinds and all degrees of capacity, tempt the enlisted men to quit the ranks as soon as the law permits them to do so. The efforts made by Prussia for some years past to retain them there are considerable. First, with a view of preparing them for civil positions, which are insured to them after twelve years' faithful service, allowances have been made to corps of troops to insure the re-enlisted, *even by civil professors*, the special learning necessary for the practice of the professions for which they are destined after discharge; second, the pay of non-commissioned officers, with their prerogatives of every kind, has been increased; third, a separate lodging and private mess-rooms for their repasts, the *régime* of which has been especially improved, have been assigned them in placing them

[4] Young men from seventeen to nineteen years old are received therein. After three months' noviciate in the schools they must serve six months as non-commissioned officers in regiments.

in barracks; fourth, their uniform has received new distinctive insignia of rank; fifth, finally the State, intervening directly, endeavors to spare them the ulterior care of the education of their children, who are admitted in large numbers to the orphan asylums of Potsdam, Pretzsch, Annaburg, and will in the future be admitted to the *preparatory institutions of the schools of non-commissioned officers*,—a new creation, of which the Prussian government has just laid the foundations and fixed the regulations. It resembles in many respects the schools of soldiers' children (*enfans de troupe*), by which I propose hereinafter to replace in France the old institution of *enfans de troupe* in connection with regiments, which it seems impossible to longer preserve.

I have devoted only a few pages to the description—which should require a book—of this vast and solid monument of military education. It is in its foundation (1717), which Prussia has gradually perfected, the oldest of Europe in the bosom of Europe's youngest nation,—a singular circumstance, which is explained by this remarkable reason, that the monument has been founded before the nation, and that it is it which has made its greatness.

It is not the number and extent of resources, however multiplied and considerable they may be, which impress most the mind. It is their choice, it is the breadth of views, and the well-considering of methods. Principle there is always by the side of fact, education by the side of instruction, and for the profession of officers, when proof of knowledge has been furnished, proof of character is to be furnished. In the thus multiplied examinations which are the common and imperative law for all military candidates, programme narrowly defined, translated by "a questioner and by questions drawn by chance" (the ordinary method of French military schools), does not exist. Consequently, an effort of the memory or chance cannot suffice to determine the success of the examination.

There is, however, a programme which the pupil has studied, upon which the examining commission questions, but such programme is for the jury only a kind of guide, which it makes use of in order to discern the degree of intelligence and to gauge the knowledge of the candidate. The candidate is then forced to study the ground-work, to comprehend to the foundation, not such parts, but all parts of the programme; consequently, he would very often fail if he was, as is now generally the case in France, only an artificial scientific production, and in a measure manufactured through a preparatory institute which pledges itself to have him admitted to the schools in a given time for an agreed sum, and as by contract.

Among all the principles which this discussion has set forth, that most productive of beneficial results for the solidity of the superior *cadres* in the Prussian army, is the obligation imposed on aspirants for

commissions to undergo the test of regimental discipline in the ranks before exercising their first command. They acquire in the preliminary noviciate, really military, important habits, excellent ideas of practical service, and finally a steadiness of character which no school can give.

Military education in Prussia is of such proportions, and its principles, as well as its methods of execution, are so broadly considered, that the national civil education is in a measure only its auxiliary. Hence it results that the whole nation is imbued with those manly aspirations which I have defined at length under the name of *military spirit.* It has a taste for arms, it respects them, and nowhere is the military profession and its followers more honored. Common belief in Europe traces back to the reign of Frederick this enviable tradition of Prussian generations. It is an error. Frederick's career, like that of Napoleon I., was spent in warlike enterprise, incessant and dangerous. In his case, also, "time, means of examination and comparison, freedom of thought, all the elements and all the creative instruments which long periods of peace produce, were lacking to enable him to be the founder of those institutions which put nations in a condition of constant preparation in advance of the possible contingencies of war."

These institutions pre-existed. He had received them from his father, from his grandfather, and, personally, his whole education had been profoundly and almost exclusively imbued with them. He had been a pupil in the school of cadets as it already existed in his time, even as it is yet to-day. But the instrument bequeathed by his forefathers, and which he perfected, he used like a man of genius; and while at the same time elevating to a high point the destinies of his country, he gave it, in the institutions which prepared them, that confidence of which Europe in 1866 and 1870 saw the results.

I end this sketch by a comparison.

While under the first empire the belief, justified by facts, penetrated —perchance for all time—the spirit of victorious France, "that every brave and fortunate soldier has in his knapsack the baton of a French marshal," the belief was strengthening itself in the mind of conquered Prussia "that without positive proof of special instruction, of intellectual culture, of aptitude, of honorableness, no one can become a second lieutenant." Of these two principles, the first was an excitant of circumstance, addressed to democracy. In effect it could only glorify the ambition or the talents of an exceedingly limited number,—favorites of fortune. The second was an inspiration of good practical sense, whose effects were to extend to all the officers of an army. It was a *living force* which must always grow.

We can, if we will it determinedly, acquire this force without ceasing to be faithful to the democratic traditions of our country.

A. W. Greely,
First Lieutenant Fifth Cavalry; Acting Signal Officer.

EDUCATION OF NAVAL CONSTRUCTORS.

MUCH has been said and written within the past three or four years by officers of the line and engineer corps of the navy on the subject of the education of officers for the construction corps, and their unsound reasoning, crude surmises, and unmistakable ignorance of the subject evince great want of information of the whole matter; but unless it could be shown that their plausible statements and reasonings were mere fallacies, the general reader might be imposed upon and many made to believe them to be correct.

In an article entitled "Thoughts on Naval Administration," the author, a commander in the navy, states "that the system at present in force in our navy-yards produces no results whatever. The shipwright apprentices are neither properly instructed nor encouraged, and a very strong prejudice exists against them on the part of the quartermen, foremen, and assistant constructors. It is believed that there is not a single constructor now in the navy who has risen from the position of an apprentice in a navy-yard. Now this fact of itself argues strongly against the manner of selection or the method of education."

The entire ignorance displayed in the above assertion is patent when I say that there are at the present time on the active list of the navy eleven naval constructors and five assistant naval constructors, of which number nine naval constructors and two assistants served regular apprenticeships in our navy-yards, and have all been employed in subordinate capacities, as quartermen, foremen, draughtsmen, and inspectors of contract work, before being appointed as assistants.

In 1864 an act was approved by the President,[1] in which mention

[1] AN ACT *to authorize the Secretary of the Navy to provide for the education of naval constructors and steam engineers, and for other purposes.*

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the Secretary of the Navy be and he is hereby authorized to provide, by regulations to be issued by him, for the education of such midshipmen, or others at the Naval Academy as show an aptitude therefor, as naval constructors, or civil and steam engineers, and may form a separate class for this purpose, to be styled cadet engineers, or otherwise afford to such persons all proper facilities for such a scientific education as will fit them for such profession.

SEC. 2. *And be it further enacted*, That, upon the recommendation of the Academic Board, such persons connected with the scientific and mechanical class as

is made as to the appointment of assistant naval constructors. It is perfectly clear to any one who reads the act carefully that it was not the intention of the framer of this bill that cadet engineers should be appointed as assistant constructors. Had such been the case, instead of establishing a class of cadet engineers (see Section 1) the class would have been styled cadet engineers and naval constructors, thus leaving them, as the law reads (see Section 2), "either to be appointed as assistant constructors or warranted as engineers."

The law as passed in 1864 was amended in 1874, and that portion of the act which compelled "cadet engineers to have been at least two years employed in the fabrication of steam machinery" was stricken out, and instead of being warranted, they were commissioned as assistant engineers.

In the revision of the statutes, the second section of the act of July 4, 1864, was divided into *two* sections, 1394 and 1403, both sections having the precise wording of the section of the act referred to, but ending by appointing them by the President and confirming by the Senate as assistant engineers in Section 1394, and immediately appointing them as assistant constructors in Section 1403, and no practical mechanical knowledge is any longer a requisite for entry into the class of cadet engineers. Having served four years at the Naval Academy, in the department of seamanship, etc., as instructor in naval architecture and ship-building, I had a good opportunity to observe the working of the engineer department and the facilities which they had for acquiring a knowledge of naval architecture or ship-construction of any kind. It was not intended that I should educate midshipmen in the theory or practice of naval construction for any other purpose than to give them such an idea of the subject that they might be able at all times to call the various parts of the floating structure they were destined to inhabit by their proper names, and to know more of the manner in which it was constructed, enabling them in the future to exhibit in conversation and on duty more knowledge of the subject than very many of the older class of officers did, from the fact that they had not had any such schooling. The cadet engineers received no such instruction when I was in the school, and what instruction they get now is from engineer officers, who, from their calling, could not have mastered the subject sufficiently to permit them to set themselves up as instructors in naval architecture and ship-building to educate

graduate therein with credit may be immediately appointed as assistant naval constructors or warranted as engineers.

SEC. 3. *And be it further enacted*, That cadet engineers, not to exceed fifty in number, shall be appointed by the Secretary of the Navy: *Provided*, That no person, other than midshipmen, shall be eligible for such appointment who shall not produce satisfactory evidence of mechanical skill and proficiency, and that he has been employed at least two years in the actual fabrication of steam machinery.

young men for that profession. If we have engineers in the U. S. Navy (with all due respect to the corps) who have mastered marine engineering, and have advanced so far in naval architecture as to be considered capable of educating men for the construction corps, why not appoint *them* at once?

A circular letter[2] was issued by the Bureau of Steam Engineering on the 4th of September, 1877, from which one would barely get the idea that it was intended that engineers should assume full charge in a very short time of iron ship-building. Chief Engineer W. H. Shock, in 1876, in answer to the interrogation of the chairman of the House Naval Committee, stated "to the Department of Steam Engineering belongs properly all work in metals, including the building of iron ships." This would include, of course, all work in making anchors, chains, guns, carriages, etc., leaving little else for any other bureau to look out for.

Two *iron* vessels, the torpedo-boats "Alarm" and "Intrepid," strange as it may seem to some, have been laid down, built, and fitted out in navy-yards under the direction and control of naval constructors. The design of the "Alarm" was Admiral Porter's, and *he* did not hesitate to put it in the hands of a naval constructor to make the calculations and build her. And it seems strange that if naval constructors know so little of iron or iron ships, they should be detailed, as they have been during and since the war, to superintend their construction and equipment.

In the report of the Chief of the Bureau of Steam Engineering for 1877, in speaking of iron ship-building, he recommends that "if practicable, more time be devoted at the Naval Academy to this particular branch of marine engineering." Thus we learn at this late day through the Steam Engineering Bureau of the Navy Department that naval architecture is a branch of marine engineering!

In the report from the same bureau for 1878, the attention of the Secretary of the Navy is called to the law providing for the appointment

[2] CIRCULAR LETTER.

NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
WASHINGTON, September 4, 1877.

SIR,—Section 1403 of the Revised Statutes provides that officers of the engineer corps may be appointed assistant naval constructors; and it is most desirable that the corps of which you are a member should at all times be prepared for an extension of its usefulness; it is therefore urgently recommended that in your course of scientific studies you devote more time and attention to the subject of naval architecture than heretofore, in order to fit yourself for superintending the designing and constructing of iron ships of war.

(Signed) W. H. SHOCK,
Chief of Bureau.

To —— ——,
Chief Engineer U.S.N.

of engineer graduates from the Naval Academy as assistant naval constructors, stating that two or three graduates had been recommended by the Academic Board, and their applications were then on file.

The chief of that bureau took occasion to fire another shot at the constructors by stating that the high order of merit attained by the cadet engineers referred to, in all their studies at the Academy, and especially their distinguished mathematical acquirements, fit them in an especial manner for the discharge of the duties of naval constructors, as they should be and probably will be conducted in the future. Truly we are a great people, and the country should feel proud to think that young men of seventeen years of age can be found who can be sent to the Naval Academy without any previous practical or theoretical knowledge of naval architecture or ship-construction, and in *four* years obtain sufficient practical and theoretical knowledge to warrant their being recommended for the position of an assistant naval constructor, "Recommended by the Academic Board." This sounds well, and many would think it all right, but, first, who comprise this board? and, second, are they men who are competent to decide whether the person recommended is qualified or not? The answer to the first is:

Position.	Rank.
Superintendent	Rear-Admiral or Commodore.
Senior Aid to Superintendent	Commander.
Commandant of Midshipmen	Captain or Commander.
Head of Department of Seamanship . . .	Commander.
" " Astronomy and Navigation . . .	"
" " Ordnance and Gunnery	"
" " Mathematics . .	Professor.
" " Physics and Chemistry	"
" " Mechanics and Applied Mathematics . .	"
" " English Studies . .	"
" " Steam Engineering .	Chief Engineer.

To the second: *No*, not one, there being not a single naval architect or ship-builder on the board.

The Academy could have had a constructor there all the time it has been without one. A naval constructor should be stationed there as Head of Department of Naval Construction. Naval architecture and ship-building being a part of the course for midshipmen, it would seem inconsistent not to have one.

The Honorable Secretary of the Navy does not seem to be without good advisers, and in his annual report to Congress for 1878, in speaking of subjects connected with the Naval Academy, the following appears: "It is desirable in the highest degree that special care should be taken in the professional training and education of naval constructors. Well-educated and competent constructors are absolutely neces-

sary for the navy. They are not only required to devise plans of vessels, but to lay down their lines, calculate their tonnage and displacement, estimate their speed, adjust their capacity for carrying batteries, and, in fact, ascertain beforehand with absolute accuracy what the vessel when finished will be capable of doing. The details necessary in all this are exceedingly minute, and the scientific attainments required are of the highest character. The performance of these duties cannot safely be intrusted to incompetent men, and therefore all the leading governments have given especial attention to the education of the constructors of their ships of war. If we are to meet these governments upon terms of equality upon the ocean, either in peace or war, we should be prepared to do so with ships equal to theirs, both in sailing and fighting qualities. There is but one way of doing this, and that is by providing a corps of competent naval constructors.

"*The law as it now stands makes no provision for the education of such a corps*, and I feel it to be my duty to renew the recommendations in my last annual report on this subject. The provisions of the statute having reference to engineers, with a few necessary modifications, if applied to constructors, would accomplish the desired object, and they could be educated at the Academy, like cadet engineers, with special reference to the details of their professional duty. Every argument in favor of building model engines by cadets applies with equal force to the construction of model ships."

Chief Engineer King, in his "Report on European Ships of War," calls attention to the system of education at the Royal Naval College, Greenwich, but he *studiously avoids any mention of naval architect students, or instructors in naval architecture or ship-building*, as belonging to or being among the offices of the school. On the 374th page of the second edition of his report, and in the 17th section, he quotes, that "engineer students will remain for six years at one of the dock-yards for practical training in the work-shops, and to receive instruction in iron ship-building." On the 375th page, 2d section, he goes on to say: "They are required to serve six years in these yards, during which time they are employed for stated periods in the several branches of the engineering factories, on board ships, on the hulls of ships, and in the draughting-room." On the 376th page, he states, "the training and education are most thorough and complete, and it is believed that from the number graduated some constructing engineers of marked ability will be developed."

Although I have a perfect knowledge of the system of naval education as carried on for the advancement of the professions of naval architecture and ship-building, as well as marine engineering in the English navy, having spent nearly four months in England in her dock-yards and schools, a refutation of the many statements made by engineers, officers, and others relative to the education of naval archi-

tects would not have the weight that a statement made by a naval architect graduate of the School of Naval Architecture in England would have; and that the question of *how much* the students of marine engineering at the dock-yards or naval college had to do with *ship-design* or *ship-construction*, I addressed a letter to W. H. White, Esq., Assistant Naval Constructor H. B. M. Navy, Member of Council of Construction, and Instructor in Naval Architecture at the Royal Naval College, Greenwich, and I trust his reply, which is given below, will be all that is required to prove that engineers have shot wide of their mark again in attempting to gain control of the building of iron ships, or graduating cadet engineers as naval constructors.

CONTROLLER'S DEPARTMENT,
ADMIRALTY, LONDON, S. W.,
6th May, 1879.

NAVAL CONSTRUCTOR THEODORE D. WILSON, U. S. NAVY:

MY DEAR SIR,—Your letter came to hand on the 3d instant; although I have not received the book yet, I would not delay writing to thank you.

Now for the information you desire as to the training of English naval architects in the government service.

Each year about thirty or forty shipwright apprentices are entered in the Royal dock-yards,—strictly by competitive examination. Usually there are three or four times as many candidates as there are appointments; sometimes there are even more in proportion, up to seven or eight times the appointments. Every one is examined who applies and can satisfy the medical examiners as to physical fitness. The educational examination includes the usual subjects, but goes on to algebra, mensuration, and the first four books of Euclid's Elements. After the result of the competitive examinations are known, the successful candidates are bound as *apprentices* to serve seven years. They actually work as if they were to continue workmen, as most of them do, but they also attend the Dock-yard School two afternoons and three evenings in the week. At these schools there are very capable masters, and it is not uncommon to find the boys after five years' attendance working such subjects as differential and integral calculus, dynamics, statics, co-ordinate geometry, etc.; of course I am here speaking of the best of them, for there is a continual process of weeding going on, and after *three years* from entry all except the most advanced boys cease to attend school. There are half-yearly examinations to test progress and determine who shall remain longer than three years. After an apprentice who does well at school and at work has been *five years* at the dock-yards, he becomes eligible for the further severe competitive examination with the best men of his year for entry as a student of naval architecture at the Royal Naval College, Greenwich. Generally there are fifteen or twenty candidates, but only *three* are entered annually; these are of course the "*crême de la crême*," having been sifted out by such a series of trials.

In my paper on the college work, published in the "Transactions of Institute of Naval Architects" for 1877,[3] you will find an account of what these men know when they join the college, and what their course is like while at the college. They remain three seasons, then pass out, and receive various appointments. Some—the majority—go to the dock-yards as "*Assistants to the Foremen;*" others go as "*Assistant Inspectors of Contract Work;*" others again join the staff of the Admiralty construction as draughtsmen. But with us promotion is so slow that many years elapse before men get fairly established in good position in the Admiralty service. In consequence, many of our best men have gone into the private trade. By book-

[3] See article appended.

post I send you a copy of our *Annual*, containing an article I wrote some years ago on "English Schools of Naval Architecture"; you may find it of some interest in your present work. Here in England and in the Admiralty service we really suffer from having more *highly*-trained naval architects than employment can be found for in suitable positions. But outside of the government yards our trained men have a good field. I am the only past student of the School of Naval Architecture who holds the position of "Assistant Constructor." I was appointed to it in 1875, having for two years previously been "Secretary to the Council of Construction." I left the school in 1867.

Next, as to the connection of engineers with ship-design and ship-building.

Here we have had the same kind of effort as you describe,—engineers trying to claim *iron* ships as their own special work,—but the thing is dying out, as it must with you. You are aware, of course, that in England nearly all our great private firms are ship-builders *and* engineers. It happened, when iron ships were first built, that engineers (or rather boiler-makers) knew most about the arrangements and fastenings of wrought-iron structures. Furthermore, nearly all these early iron ships, except those on canals, were also steamers, for which the machinery was constructed by the people who built the hulls. These conditions were not permanent, and now, even in the largest private firms, the ship-building departments are under the distinct management of *ship-builders*, while engineers manage the engineering, and leave the design of ships alone. Our great registry societies for merchant ships also employ *shipwrights* to survey the hulls and equipments of *all* ships. Engineers survey machinery only. In the Admiralty service engineers have absolutely nothing whatever to do with the designing or construction of the hulls of any class of ships,—iron, composite, or wood; nor have they done anything towards the remarkable progress made in structural improvements of ships. All this is the work of naval architects. Our engineers deal only with questions relating to engines and machinery. The engineer students who come to the college get only a very elementary course of instruction in ship-building at the college. At the dock-yards they spend about six or nine months in becoming acquainted with the principal features of iron ships and ship-building, but the course is adopted for a very special reason. When serving afloat on Her Majesty's ships an engineer has to take charge of the double bottom, the steam pumping and flooding arrangements, watertight doors, etc., and it is for the purpose of fitting engineers for such a charge that the very limited course of training above described is given. Engineers receive no instruction whatever in the principles and practice of *ship*-designing, whereas you will see, on reference to my paper, how extensive is the course of study for naval architect students. Within the range of my knowledge there has not been a single instance in which an engineer has been employed as an overseer of the construction of iron ships. The Admiralty *always* appoint shipwright officers.

I have every respect for the ability of engineer officers; but after myself going through a long course of study in the principles of heat and the steam-engine, I have come to the conclusion that a man has quite enough to do mastering and practicing one profession; that is the general opinion in England, I think. Engineers do not commonly attempt ship-designing; naval architects rarely attempt engine-design.

The whole course of training for the two professions involves many similar and identical branches, particularly on the mathematical side; but on the strictly technical and professional the two courses are perfectly distinct.

In France, as you are doubtless aware, an officer of the *Génie Maritime* is supposed to be competent either for naval architecture or marine engineering. I believe, however, that in actual practice a man is usually appointed to one branch, and sticks to it for life.

I hope these hurried explanations may be of some service to you.

Yours truly,

(Signed) W. H. WHITE,
Assistant Naval Constructor H.B.M.N.

The paper on college work, referred to in Mr. White's letter, is as follows:

The general regulations established for the admission of students to the Royal Naval College compel candidates to pass the following examination:

1st. The ordinary Rules of Arithmetic.

2d. Algebra, up to Quadratic Equations, the Three Progressions, the Binomial Theorem, and the Theory of Logarithms.

3d. The subjects of the first four books of Euclid's Elements, Proportions and Similar Figures, or the Definitions of the fifth book, and the Proportions of the sixth book of Euclid's Elements.

4th. The Definitions and Fundamental Formulæ of Plane Trigonometry, including the solution of Plane Triangles, De Moivres's Formula and its principal applications.

5th. Elements of Statics, Dynamics, and Hydrostatics.

6th. Co-ordinate Geometry, up to Equations of the Conic Sections.

7th. Geometrical Drawing.

All the Admiralty students have the great advantage of spending five or six years in a dock-yard before joining the college. They consequently have opportunities of becoming skilled workmen and fair draughtsmen, besides acquiring familiarity with the building and fitting of ships. Concurrently with this they receive a mathematical training which is much in advance of that required to pass the entrance examination above described (the entrance examination referred to is more especially established for private students, of which there are a limited number admitted), and on entry the average Admiralty student possesses a knowledge of the differential and integral calculus, with their application to mechanics, etc. This previous training is never found to be too extended, but it is a great gain in all subsequent work.

As to the course of study in naval architecture pursued at the Royal Naval College, the full course consists of three sessions, each of nine months, from October to June, inclusive.

The arrangement of the work is made to conform as closely as possible to these divisions of the time of study. Respecting the range of mathematical studies, I need only say that it is so extensive as to enable the students to grapple with the highest mathematics to be found in any treatise on naval architecture, or to attempt the solution of the important problems occurring in investigations in the behavior, construction, and propulsion of ships. The whole of the mornings throughout the session are devoted to mathematics; two or three of the afternoons are devoted to professional work, and one or two afternoons to practical courses in the chemical and physical laboratories. There are, in addition, regular courses of lectures on various subjects of interest.

There are two instructors for the students of naval architecture, viz., an instructor in ship-building, including ship-drawing and laying-off, and an instructor in naval architecture. The former begins his course of instruction when students enter the college, and continues to employ them on two or three afternoons in each week during the whole of the first session, and about one-third of the second session. During that time the average amount of work performed includes the preparation of one or two sheer drawings and midship sections, in order that the student may secure facility as draughtsman, and the laying-off of the fore and after bodies of a wood ship. The Admiralty students acquire a considerable knowledge of these subjects in the dock-yards before joining the college, but few of the private or foreign students possess any previous knowledge of this kind.

The course of studies under the instructor in naval architecture is more extensive and continuous through the whole time of study at the college.

During the first session students devote attention exclusively to *ship calculations* during one or two afternoons of each week. Each student works independ-

ently, from the drawings of an actual ship, and is taught to perform, and in nearly all cases does perform, the calculations mentioned below.

Ship Calculations performed by Naval Architect Students at the Royal Naval College during their First Session.

1st. Proof and application of rules for finding the areas and the position of the centre of gravity of plane curves, including Simpson's Rules, the method of Polar Co-ordinates, and the Geometric Process.

2d. Proof and application of rules for calculating the displacements of ships and position of the centre of buoyancy, including the ordinary method by double application of Simpson's First Rule, Dr. Wooley's Rule, and the Geometric Process.

3d. Construction and use of curves of displacement, tons per inch immersion, and area of immersed midship section.

4th. Proof and application of rules for calculating the position of the metacentres for transverse and longitudinal inclinations.

5th. Construction and use of metacentric diagrams.

6th. Explanations and applications of rules for tonnage measurements, including Builders' Old Measurement Register Tonnage, Freight Tonnage.

7th. Graphic representations of the longitudinal distribution of weight and buoyancy in ships floating in still water, together with the construction of curves of loads, sheering forces, and bending moments.

The work of the first session may be said, therefore, to comprehend all the ordinary calculations made for a ship, with some special methods which are useful as checks and aids in ship-designing. As a rule, I find the students capable in their subsequent work, not merely of applying the various methods learned in their first session, but of selecting the process best adapted to economize labor, and to secure accuracy in the various cases arising in practice.

In the earlier part of the second session, during the three or four months while the students are partly engaged under the instructor in ship-building, they continue their work on ship calculations, and are taught how to perform the following more difficult operations:

1st. Calculations for statical stability and construction of curves of stability.

2d. Calculations for dynamical stability by Moseley's formula.

3d. Calculations for and construction of the loci of the centre of buoyancy, metacentre and centre of flotation of ships for all transverse inclinations, under certain assumed conditions.

These three calculations are closely related to one another, and the students who learn how to perform them ought to have no further difficulty in dealing with any calculations connected with the buoyancy and stability of ships.

This course of ship calculations terminates about the end of the Christmas term, in the second session, and is preliminary to the work of ship-design, which is then commenced and continued through the remainder of the second session and the whole of the third session. Two or three afternoons in each week are thus occupied.

Throughout the course of study in naval architecture it has been my desire to arrange, not merely for the instruction of students in the various methods of calculation, but for the actual performance of the work by each student. In the case of ship-designing, however, the amount of work to be performed is usually too great to permit of single students working on a design, and it is customary for them to be grouped in twos or threes, care being taken that each has a share in all the important parts of the work. This includes the preparation of the drawings and calculations connected with the design of a ship of some selected type. The character and extent of the work done may, perhaps, be better illustrated by the following outline of that which would ordinarily be done in designing an ironclad ship:

1st. Preliminary estimate of dimensions and displacement required to fulfill the desired conditions as to draught, trim, armor, armament, speed, and equipment, etc., as well as to provide sufficient stability.

2d. Preparation of sheer-drawing, midship section, outline specifications for scantling, plans of decks, battery, etc., required for making an estimate of the weight of hull, armor, etc.

3d. Calculations of displacement, and position of centre of buoyancy and metacentres.

4th. Detailed calculations for the weight of hull, armored and fitted, together with the position of the centre of gravity of the same, in height and length.

5th. Detailed estimate of weights of equipment, with position of their centre of gravity.

6th. Combinations of the results of the 4th and 5th to determine the weight and position of the centre of gravity of the completed ship. The comparison of these results with those obtained in the 3d shows whether the new design is successful as regards draught, trim, and stiffness, or whether any corrections are necessary in the form or stowage. Having made these corrections, passes out of the preliminary stage, and only its details require to be worked out.

7th. Preparation of outline profile and plans of deck and hold, showing the main features of the stowage throughout the ship.

8th. Preparations of sail draught, with calculations for the area and centre of effort of plain sail and power to carry sail.

9th. Calculations for and construction of curves of displacement, tons per inch, and immersed midship section; also for the metacentric diagram.

10th. Calculations for statical stability, construction of curves of stability, estimate of dynamical stability.

11th. Calculations for speed under steam.

12th. Calculations for longitudinal bending moments in still water and among waves, including the construction of curves of weight, buoyancy, loads, sheering forces, and bending moments.

13th. Construction of equivalent girders, and estimates of longitudinal strain on the structure.

A student who has passed through this course ought to be thoroughly competent to undertake the design of any class of ship for which the fundamental conditions were furnished. It is not, of course, anticipated that the college training will, to any extent, replace the necessity for experience in designing ships, or supply the facility or information to be obtained by extensive practice. On the other hand, that course gives a good grounding in the principles of design, and enables the student to proceed intelligently in whatever direction his after-work may lead him. Good evidence of the thoroughness of the training is found in the fact that very many students have been at once employed in the Construction Department at the Admiralty on leaving the School of Naval Architecture or the college; and both Mr. Reed and Mr. Barnaby have borne public testimony to the useful work which has been done by them. During the third session students of naval architecture also attend a special course of about thirty-five lectures on the *Stability and Oscillations of Ships*, delivered by the instructor in naval architecture.

THEODORE D. WILSON,
Naval Constructor U.S.N.

THE AUTOBIOGRAPHY OF AN OLD BRITISH SOLDIER.

PART II.

THE serious wound in my hand disqualifying me for active duty, I was, for some time after the return of the company to Bombay, confined to my quarters, with leave to ramble about the town and suburbs. Bombay was interesting on account of the varied character of the population and the consequent diversity of manners and customs. With the exception of a few rich stores kept by the Europeans and Parsees, the bazaars or market streets were filled with stalls and stores occupied by grain-sellers, fruit-dealers, venders of hardware and cotton cloths, etc. The streets teemed with the various races,—Hindoos, with turbans—or *puggries*, as they call them—of different forms and colors, Mussulmans (chiefly domestics), Jews, Arab horse-dealers, Persians, Armenians, Parsees, Chinese, half-castes, and a numerous assortment of half-nude pariahs, who followed all the menial occupations, such as water-carriers, sweepers, palankeen-bearers, porters, etc. Antagonistic in religion, yet all lived in harmony. Perhaps a more striking proof of the religious toleration prudently upheld by the government could scarcely be exhibited anywhere within the same compass. The mosque of the Mahometan was to be seen nearly in juxtaposition with the pagoda of the Hindoo and the augiaree (or Fire temple) of the Parsees, descendants of the Guebres or ancient Persians who fled from Moslem persecution to Western India; the Armenian church, where the Greek service was performed, the Roman Catholic cathedral, the Presbyterian kirk, and the Protestant Episcopal church, all were within a stone's throw of one another.

I seldom went into the barracks, for I dreaded malaria, but as it was of great consequence to my prospects of advancement that I should be *en evidence*, I undertook to perform what was called lobby duty, which meant the seeing that the barracks were kept in order, the beds folded up, the accoutrements hung above the soldiers' pillows, etc. This sort of work could be as effectually performed by a man partially *hors du combat* as by a more effective officer.

Crossing the parade-ground one evening after dark, my ear was greeted with a chorus of voices singing to the well-known air of "Auld Lang Syne." There was more of the *fortissimo* than the *piano* in the choral music, but the time was good, and the heartiness of the vociferation was undeniable. Drawing nearer to the barrack whence the sounds proceeded, I found a group of artillerymen who had recently returned from the Persian Gulf seated on two cots, with a large copper camp-kettle between them, whence issued a not unpleasant aroma. The kettle proved to contain a concoction denominated "arrack punch." Arrack, called by the Turks and Arabs *raki*, and by the European soldiery *rack*, from the pains which followed upon too great an indulgence in the liquor, was the cheap substitute for Jamaica rum and cognac. The song which the group roared out comprehended a modest eulogium of the services of the artillery. The author, a gunner named Pomeroy, was a highly-accomplished scholar, an "Irish gentleman" in fact, as distinct from the "gentlemen from Ireland" who contributed to the force. He had, for reasons of his own, abandoned the profession of the law, which he practiced on a small scale in Dublin, to become a soldier. The song appeared to possess much poetical merit, and as it was a sort of historical record of the deeds of the corps, and I had had a share in the operations, I embalmed it in my memory. It began,—

"Assemble, comrades, round the cot.
Bencoolen's nectar foams;
What, though a foreign clime's our lot,
Though severed from our homes,
Shall soldiers trifling ills deplore,
Give way to senseless têars?
No! seize the cup and toast the corps
Of Bombay Cannoneers."

And the cup *was* seized, and passed round to the glory of the battalion. Pomeroy had been partially educated at a French college, hence the employment of the unusual title "Cannoneers." The song continued,—

"Thoroughout Hindostan's fertile plains,
Despite her sable sons,
St. George's cross triumphant reigns,
Supported by our guns.
E'en yet the echo of their roar
The scared Mahratta hears.
Then seize the cup and toast the corps
Of Bombay Cannoneers."

The Mahratta confederacy of three powerful chieftains had been finally crushed, after a stubborn contest of many years' duration. The Bombay Artillery had played an important part in the struggle. The song now reached the exploits in the Persian Gulf,—

"On famed Arabia's arid coast
Our laurels fresher grew.
The Moslem corsair's ruined boast
Proclaims it but too true.
There, murd'rous tyranny no more
In bloody crest appears.
Then seize the cup and toast the corps
Of Bombay Cannoneers."

The ditty now took a quieter turn, and the soloist, a *basso profundo*, who had been converted from a mellifluous tenor by frequent "potations pottle deep," wound up in a maudlin manner and with *une voix larmoyante*,—

"When duty's period shall arrive,
And home rejoice our souls,
To banish care we'll all contrive
Around our flowing bowls.
With wond'rous tales of Indian lore,
Amidst our old compeers,
We'll grasp the cup and toast the corps
Of Bombay Cannoneers."

Alas! of the numbers who were assembled to speak of the future, few ever again tasted of the fancied pleasures of home. Disease, accelerated by intemperance, carried the greater part to premature graves, and those who became the victims of chronic rheumatism, consumption, and other direful complaints disqualifying them for further service, were sent back to England to die in a pauper's hovel, or drag out a painful existence for a few months on a pension of sixpence per diem. But, besides the men who were enfeebled and ruined in health by the climate and pernicious indulgences, many, disgusted with army service, resorted to sundry contrivances for rendering themselves cripples for life. Some would not scruple to smash their left thumb that they might be unable to "serve the vent" of a gun; others would draw their teeth to prevent their biting a musketry cartridge;[1] and not a few would get ruptured at gun-drill by excessive exertion with the sponge-staff, while some availed themselves of the existence of noxious plants in neighboring jungles to stain the skin until the whole surface of the body bore a frightfully leprous aspect. All these horrible artifices became so common that I was induced to get up and print a little volume with the double purpose of exalting military life by the accumulation of anecdotes of gallantry, and exposing and denouncing the malpractices of the self-mutilators. The government and the European regiments bought the book, which bore the title of the "Soldiers' Friend,"

[1] So many years have elapsed since the old style of musketry practice was in use, that perhaps it is necessary to explain that the cartridges were composed of thin brown paper. The powder end was bitten off, a few grains were then dropped into the pan attached to the touch-hole, and the residue rammed down the barrel. It was a tedious process, and, when the cartridges were wet, an entirely useless one.

but the artillery burnt their copies in the barrack-yard and denounced me as a traitor to the cloth. Curses, like young chickens, generally go home to roost. I had performed a duty; the abuse evaporated and the profit remained. The rankling hostility, however, of some of the men threatened my peace, and one fellow took a cowardly advantage of my physical infirmity to assault me while in the execution of the lobby duty. I found him sweeping a bedroom. He had failed to open a window to admit of the escape of the dust and other atmospheric impurities. I desired him to let down a sash. He refused, and applied an insulting epithet to me. I repeated the order. He only exclaimed, "Get out of that!" and, striking me with a heavy broom, knocked me down. Recovering my legs with difficulty, I rebuked his poltroonery in assaulting a superior officer who had a disabled arm. He repeated the blow, accompanied by a terrific curse. I got to my feet again, and, hastening to the guard-house, sent a corporal and a file of men to arrest the offender. He was handcuffed, and the affair being reported to the lieutenant-colonel in command, a court-martial was convened, and Flinn (for that was his name) was consigned to a dark cell called "the Black Hole" for a month on rice and water, with the reversion of one hundred lashes when his term of imprisonment had expired. Three days later the wound in my hand inflamed, from the excitement and irritation of the Flinn affair, and I was ordered to Bombay to see the chief surgeon. But I could not bear the idea of leaving my assailant immured and half starved in a miserable dungeon, whence the light of day was almost totally excluded. Much as he merited punishment for a serious and rather pusillanimous infraction of the law, I fancied a fortnight of such seclusion would drive him insane. I therefore went to the commanding officer and begged the remission of the remainder of the sentence. The colonel assented, and accompanied me to the Black Hole. The sergeant of the guard opened the door, and the poor wretch emerged from his dismal cell looking hideously pale and sick. The colonel improved the occasion to dwell upon the enormity of the offense, and letting Flinn understand that his manumission was the result of my intercession, the miserable culprit was released and sent to his duty. I then went down to Bombay, but on my return to the cantonment, three weeks later, perfectly recovered, I found my quarters cleaned and decorated with flowers, my sword and its brass sheath polished as bright as gold, and my fusil in excellent order. Inquiring as to the author of all this volunteered care, the fact was revealed that Flinn, in the exuberance of his gratitude and remorse, had obtained leave to take the office upon himself, and when he came up to see me he fell on his knees, grasped my hand and kissed it with visible fervor and emotion. I recall the incident, so honorable to the feelings of a poor Irish soldier, with pleasurable sentiments. Not long afterwards Flinn was attacked by cholera morbus, and died in my arms. At his

request I held his cold and clammy hand until the spirit had passed away.

The cholera—that terrible scourge of the human race—was, in 1820–21, comparatively a new disease. There is evidence extant that it was known in India more than a hundred years ago; but it seems to have attracted little attention until 1817–18, when it burst out in the south of India with fearful force, and spread its devastation in a westerly direction, until it ravaged Europe for some years. Since then it has maintained its position in nearly all parts of the world, baffling the efforts and confounding the science of the most able practitioners. Whether it was epidemic or endemic remained a question, and the remedy, when it seized an individual, was a problem difficult of solution. Brandy alone, or mixed with laudanum, was tried in the incipience of the disease ineffectually; ice, in allaying the burning thirst of the sufferer, was more efficacious, but neither of the means sufficed to arrest the rapid progress of the disorder. Not until 1866 was an infallible cure discovered, and as that new system is still less known than such a blessing deserves to be, I may be excused for mentioning it. A Dr. Ribton, who had been practicing for some years in Naples, on the outbreak of the cholera in that filthy town, applied himself to the discovery of the substance in the form of drugs that would have any specific action on the choleraic poison. He took the ordinary method of testing the efficacy of the drugs by bringing them into contact with the intestines of men who had died of the disease, and he found that *camphor* was the nearest approach to affinity with the poison supposed to exist. But the microscope revealed, under the white lining of the diseased membrane, a certain substance of an alkaline nature, which required an auxiliary to camphor in its removal. Accordingly, after divers experiments, Dr. Ribton hit upon hydrochloric acid, and by combining its gas with camphor, "chloride of camphogen" gave the happy results. Applied diluted with oil to the diseased membrane, it at once removed every trace of the virus. Dr. Ribton then prepared a medicine on the principle of his discovery, and the effect was a *perfect cure in every case*, though some of the patients were suffering from the gravest symptoms before treatment commenced. As much as sixteen to twenty-four hours had elapsed since attack set in: the voice was gone, the pulse was thready, and cyanosis had begun. I have dwelt on the subject of cholera in this place because it is in itself a matter of great importance and germane to the narrative; and it may be that Dr. Ribton's recipe may, at some time or other, be serviceable to the army and navy of the United States.[2]

Returned to the active duties of a soldier, I was now detailed to

[2] If any medical officer should desire a more minute and technical description of the remedy, I shall be happy to send him a free translation of the requisite portion of Dr. Ribton's *Italian* narrative.—J. H. S.

superintend the gun-drill of the recruits who had not been on service. A smooth-bore 12-pounder howitzer stood in the centre of the parade-ground, and at this formidable piece of ordnance stood seven men and their instructor. The formula ran thus: No. 1 sponged and rammed, 2 loaded, 3 served the vent and primed (there were no locks and triggers in use then. The priming was contained in a quill, surmounted by a small quantity of powder, wrapped in thin paper. After holding his left thumb over the vent to exclude the air while the sponging went on, No. 3 went to the right about and stuck the quill into the vent-hole, returning to his first position); No. 4 fired; he held a port-fire, which was lighted from a linstock attached to the gun-carriage, cutting off the burning portion as soon as the gun was discharged; No. 5 pointed and gave the word of command; No. 6 carried the cartridges to No. 2, and No. 7 remained in the rear in charge of the tumbril. Bang! and the shot flew from the piece, generally touching the muzzle *en route*, and, deflecting to the left or right, effectually avoided the object aimed at. It was said by a facetious old general officer (Sir Charles Napier) that if a man wished to escape being shot, he should place himself against the bull's eye of the target. The rains falling in India for four months continually, the powder was always damp, in spite of tarpaulins and weather-chests, so that when the port-fire was applied to the priming a whizzing, wild fire preceded the explosion, giving warning to an enemy in front of what might *possibly* ensue. Percussion-caps were even unknown—or, rather, were not in use—sixty years ago. It is strange that Napoleon I. should have failed to detect their value. So far back as 1807 the invention was brought to his knowledge and its adoption by the French army suggested, but either on the ground of the cost or the delay in fitting four hundred thousand muskets with new locks and manufacturing the copper caps, he objected to the abolition of the hammer and flint. In the British army, the invention was not introduced until 1827. But John Bull is always slow to adopt changes in any part of his system, civil or military. New ideas are scouted as innovations,—ingenious implements derided as new-fangled notions. The breech-loaders were opposed at headquarters for some time after their introduction into the Prussian army, because, forsooth, victories enough had been won with smooth-bores and ramrods and the bayonet at close quarters. No account was at first taken of the fact that foreign armies were equipped with rifles which carried a bullet one thousand yards, and could annihilate battalions while they advanced to the charge.

* * * * * * * * *

I was now getting tired of the anomalous position I occupied in the service. It was hybrid. Tolerated rather than desired, I was half officer, half gunner, with no prospect of promotion, pay, or pension, awaiting a cadetship which never came, and approaching the limits of

the age when admission to the *Royal* Army as a commissioned officer was allowable. At this juncture two accidents happened which appeared to give me an opportunity of arranging my future destiny. An aged relative had died, bequeathing me five hundred pounds, and a king's (Royal) regiment arrived from England to relieve one (the Sixty-seventh, I think) whose period of service in India (fifteen years) had expired. As some of the officers in the relieving regiment were men of fortune, who did not care to run the risk of destroying their health and ruining their valuable constitutions by remaining in the country, while several of those who belonged to the returning corps could not afford to live on their bare pay in England, an exchange was permitted, or a sale of commissions connived at. I thought at once of purchasing an ensign's commission in the relieved regiment, but the price put upon it (four hundred and fifty pounds) and the cost of equipment were beyond my immediate means. Moreover, the prospects in the Royal service for a man without private fortune were of the most gloomy description. The newly-arrived regiment—called the "Queen's Royals," in honor of the Infanta of Portugal on her marriage with Charles the Second—was commanded by a lieutenant-colonel of twenty-seven years of age, but some of the captains of the corps were forty years old, and there was a lieutenant of thirty-five. This was an illustration of the villainous purchase system, which continued in force until its abolition by the ministry of Mr. Gladstone, in 1873. If, on the occurrence of a vacancy by retirement of a field-officer, the captain first on the roll of the regiment to succeed as natural heir to the retiring officer had not the means of paying for the vacant commission, and a few hundred pounds to boot, he was liable to be passed over by some younger officer, who had the means at command. In this way the youthful scions of the aristocracy or the sons of rich squires or manufacturers leaped over the heads of worthy veterans, who had been for years in the army and seen war service. A young captain possessed of means could go from the regiment in which he held a commission to one in which he was a stranger with the rank of major, to the entire supercession of all the poor captains who could not pay the difference. No wonder that much ill feeling was generated by this system. It is very true that sometimes an officer of true genius was lifted out of a subordinate position to make his mark in command,[3] who might otherwise have languished in obscurity until his hair was gray and his *esprit militaire* had evaporated; but, on the other hand, much favoritism and cruel injustice, besides regimental discontent, arose out of the purchase system, and it was surprising that the country had been so long tolerant of the neglect of "patient merit."

[3] The great Duke of Wellington rose to high command at an early age through the purchase system. On the other hand, Henry Havelock's poverty kept him as a subaltern and a captain for many long years.

A strict seniority system has now taken the place of the money-traffic, and works satisfactorily. The *dives pecunia* is no longer the arbiter of promotion.

Altogether I saw no reason to regret that my circumstances kept me out of the melancholy condition in which "chill penury" would have frozen "the genial current of my soul," especially as an event came to pass (the second "accident" of the two) which placed me in a very agreeable military position, and afforded full play for my warlike proclivities.

Among the feudal princes who were suffered, after the long wars urged by the English in India, to maintain their regal position and govern their possessions in their own way was the Nizam,—an hereditary chieftain whose immediate ancestry ruled the south of India, as representatives of the Emperor of Delhi—the Great Mogul. The capital of his dominion was (and is) Hyderabad, in the Deccan. He acknowledged the suzerainty of the East India Company, and was unexceptionally loyal and faithful. But with the double object of enabling him to coerce the great landholders who had to pay him revenue and protect himself from outrage and disturbances, he was permitted to maintain a military force *officered chiefly by Europeans*, and paid by himself. The British government no doubt held it of importance to keep an eye on the eccentricities of the Nizam, and to control him, in some measure, if necessary. Intrigue was always rife at the native courts, and an *imperium in imperio* was a dangerous element in British India which could not be too carefully watched. Hence the existence of the "Nizam's Contingent."

Now, the commissioned appointments in this force were in great demand among not only the Company's regular officers, but likewise among outsiders who had gone out to India to seek their fortunes. It —the Contingent—had powerful attractions. There was a brilliant court at Hyderabad, the costume of the cavalry—green and gold embroidery—was elegant and fanciful, the military duties light, the pay good, the allowances liberal, the opportunities of field sport considerable, and a little warfare with disaffected subjects and neighboring chieftains within the scope of possibility.

It happened that one of the field-officers in the Nizam's service had been a paymaster in the Bombay Army. Through the neglect or rascality of his subordinates his accounts had got into disorder, and there was a defalcation to a serious extent. He was summoned to Bombay to make things straight. But he was not a good accountant; he had performed his financial functions vicariously. Intimate with the officers of the artillery, he asked one of them to name an efficient *employé* who could convert his chaos into order. I was named for the duty, and readily assumed it. By dint of patience and labor the complicated web was unraveled in a few weeks, and the paymaster stood before his

government cleared of all reproach but too much confidence in unworthy clerks. The paymaster offered me a handsome *douceur*, and promised to ask the government to appoint me a lieutenant in the Nizam's service. I declined the *douceur* and readily accepted the lieutenancy. My patience was at length rewarded, my ambition gratified.

Of course I selected a cavalry commission, and lost no time in equipping myself for the position. The Hindoo tailors of Bombay were skillful craftsmen, and reveled in the opportunity of bedizening an officer whose costume demanded a profusion of gold lace. This emblazonment of my person, my sword, pistols, tent, furniture, trunks, canteen, etc., consumed two hundred pounds of my legacy. Then there was the saddle, holsters, horse-cloth, etc.,—all necessary for the horse,—a costly portion of a trooper, which demands some thought. Bombay, as the port in India nearest to the Persian Gulf, is an excellent mart for the Arab horse-dealers, who bring their beautiful nags direct from the breeding districts of Arabia. In form, the Nedj Arab is the most symmetrical and attractive member of the equine race, and is reared and loved by his breeder as tenderly as if he were his own offspring. The arched neck, the inflated nostril, the small head and bushy mane, the concave back, the flowing tail, the taper legs, and the deer-like foot, present "a combination and a form" unrivaled in the whole zoological kingdom. The speed of the Arab is, of course, relative. Tried by himself, he exceeds all others, but placed in competition with larger horses owning longer legs, he necessarily takes a secondary place. It has been gravely urged that since the days of *Eclipse* and *Flying Childers*, horses of almost entirely Eastern descent, the British thoroughbred has deteriorated because unmixed with Arab blood. But this has been proved to be a mistake. Admiral Rous, of the British Navy, more distinguished as a jockey than a sailor, and a universally acknowledged authority on all turf matters, declared that the race-horse of the present day is as much superior to the race-horse of 1750 as that creature was to the first cross from Arabs and Barbs with English mares, and again as *they* were to the old English hack of 1650. No doubt the English thoroughbred has improved immensely, but that does not prove his superiority in all things to the Arab. He is a larger and stronger animal, and has a longer stride, which gives him a great advantage in a race; but if it were possible to run an English or American horse in Arabia, and the weight put upon the Arab were proportioned to his power and his short stride, it would be found that the difference between them is not very considerable after all. An Arabian competed with English race-horses for the Goodwood Cup in 1863, and carried less than six stone, but he was beaten, for all the conditions of equality were not and *could not* be observed. The diet of the Arab differed from that to which he had been accustomed,—he had made a long voyage, cramped in his limbs, and he ran on a soil to

which he was unaccustomed. On the Indian turf he runs better, and the time of his races does not show disadvantageously against the speed of horses from England, Australia, and the Cape of Good Hope. But these, again, are not at home, in respect either to food, soil, or freedom of limb, so no fair comparison can be established anywhere.

Not alone for its symmetry and speed did I select an Arab and pay one hundred and fifty pounds for the lovely creature. I knew that there was plenty of hog-hunting in the Nizam's domain, and that no kind of horse is more reliable in that sport than the little Arab.

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If the interest attaching to a peculiar kind of field-sport is to be measured by frequency of description and variety of illustration, there can be no doubt that "pig-sticking" occupies the foremost place in the estimation of India sportsmen. Strangers to that sort of thing may naturally express surprise that it should be preferred to tiger-hunting, which, with the ordinary array of elephants and beaters, assumes an aspect especially Oriental; but the experienced old hand knows that there is a wide difference in the excitement attendant upon the two descriptions of chase. The chances in a tiger-hunt are greatly against the *carnivora*. If he knew his own interests, the beast, as soon as sighted, would quickly get away from his armed adversaries, for he has not the remotest chance of escape when he comes to close quarters with them. His claws may scratch the hide of the elephant on which he springs; the mahout (or driver who sits on his neck) may fall a victim to the suddenness of his attack; his weight on the head of the elephant may bear the colossal animal to the ground, and topple over the occupant of the howdah (the sportsman's box); but rifle-ball after rifle-ball is sent into his body by the rest of the party with unerring precision and rapidity, and he ultimately succumbs in the brief conflict. This supposes an extreme case of successful assault in the first instance; more frequently the tiger's fate is sealed before he can make his spring. Gorged with his breakfast or a prolonged nocturnal meal, he is incapable of showing fight, and often dies ignobly as soon as he is seen. A volley from half a dozen howdahs and the repleted brute gives a receipt in full, in the shape of a few snarls and an expiring groan.

It is otherwise with the boar. That gallant denizen of the luscious sugar-cane plantation pits his tusks against the sportsman's lance; his speed against the pace of the little Arabs on which his pursuers are mounted; his rush against the nerve and skill of the bipedal antagonist. The huntsmen feel that they have an opponent worthy of their steel, and are proportionately elated at the prospect of victory. With what glee they receive intelligence that a boar has been roused from his "frank" in the vicinity of the camp! "Boot and saddle"[4] is instantly sounded, and in a few minutes every man who owns a spear is

[4] "Butta sella," the old Italian war-cry.

equipped in flannel jacket, cords, jackboots, and velvet hunting-cap, and springs at once into the pigskin. The approach to cover is gentle and cautious; the Arab will have no breath to spare in the inevitable race. "There, there, sahib!" shouts the leading beater, and the black bristling back of a huge grunter is seen just above the high grass jungle. "Drive him into the open!" is the order promptly given and as promptly obeyed. Piggy, alarmed, starts from his domain, and is soon seen scudding over the rough ground *en route* to some safe shelter. "Off!" and away goes the group full tilt. "First spear!" is the object of each cavalier; personal honor, the tusks for a trophy, and possibly the issue of a wager are the incentives to speed. The blood mounts up, the nerves are braced, the nostrils dilate as the hog is neared and a sharp contest is imminent. Close quarters. Thud! the spear has stricken the game. He does not fall, however, he turns enraged, and, bent on mischief, dashes at the nearest huntsman. The moment is critical; one turn of the wrist, one touch of the off spur, and the little nag springs out of danger. A moment's hesitation, or an awkward piece of equitation, insures a terrible gash, perhaps disembowelment, and the hog revels in a momentary triumph, whilst number two of the huntsmen delivers a second thrust. Still the grizzly, gray, daring animal refuses to yield; he stands at bay, and only gives up the ghost when loss of blood, or a *coup de grace* in the shape of a well-delivered poke, puts an end to his hopes of successfully prolonging the contest. Now for the banquet; spread the cloth, dig a stove in the earth, out with the gridiron, cool the claret, the Bass, and the Alsop, and to lunch with what appetite ye may. And be sure the appetite is not bad after such a run, such a fight, and so decided a result!

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Being now fairly equipped for my new service, I embarked at Bombay on a vessel bound to Madras, as that was the nearest point whence to march to Hyderabad. Twelve days were consumed in the passage. I lost no time in proceeding to my new destination. The practice was to send my tent and servants over-night on a march of fifteen miles or less ahead, according to the distance of a suitable halting-place, while I followed early on the following day, arriving in time to find breakfast prepared under the shade of a mango grove or a banian-tree. One incident only enlivened the trip.

As I passed along the road in the vicinity of a small hamlet I heard the beating of tom-toms, the braying of trumpets, and the yells of a populace around a blazing pyre. Curious to learn the cause of the tumult I rode to the spot, and found it arose from the preparations for a *suttee*. A poor girl of fifteen, left a widow, was about to immolate herself on the funeral pile of her deceased husband. As I knew the government was opposed to any interference with the rites of the Hindoos, I did not attempt to disperse the assembled priests and their myrmidons, but I

could not help speaking to the widow herself, and tried to dissuade her from the self-sacrifice. But she had been drugged to an extent to render her partially insensible to any remonstrance or entreaties. She believed that the contemplated suicide, in conformity with practice, would insure her eternal beatitude, and of course she knew that the alternative of her refusal to perform the ceremony would degrade her to the menial offices of a household. Without hesitation, therefore, she removed her silver rings, bracelets, and ear-rings, and, handing them to one of the villains who superintended the sacrifice, made me a salaam, and walked to the pile, the noise of instruments and discordant human voices being at once renewed. I resumed my march at a gallop, sick at heart that such abominations should be permitted. Five or six years later the courageous Lord William Bentinck, who had become Governor-General of India, took pains to ascertain if the self-immolation of widows was enjoined by the Shasters; and finding that the inhuman practice had not the sanction of ecclesiastical law, with one stroke of his pen abolished the usage, declaring that all who might aid and abet a suttee should be deemed accessories in a case of murder, and be executed for the offense. Thenceforward there were no suttees in the British territories.

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Arriving at Hyderabad, I was soon initiated in the duties of a lieutenant, and found life pleasant enough in the polished society of the "Resident,"—as the representative of British authority was called,—and the officers of the contingent and of the regiments in the vicinity. Balls, dinner-parties, races, and hunting-excursions consumed several months, and I began to think that I was to play at soldiers all my life, until a call for military aid from the principal authority in Behar, part of the Nizam's possessions, gave me the chance of smelling powder once more.

It seems that one of the many chieftains in the still unsettled southern Mahratta country had been raiding the lands lying between the territories of the Nizam and those of the Rajah of Nagpore, and that the whole country was in a state of alarm. To capture the chieftain, Dowlut Sing by name, and break up his ruffianly band, computed to amount to two or three thousand armed men, was the duty imposed upon the Nizam and his neighbor, conjointly with the English troops. A price was put upon the head of Dowlut Sing, and, of course, every officer was anxious to become his captor. The force contributed by the Nizam consisted of two hundred cavalry, four hundred infantry, and about one hundred mounted irregulars. A Major Morrison was named to command this auxiliary armament, and as he had the reputation of being a good soldier, who had distinguished himself in the Mahratta war, we went forth in great spirits. Seven rapid marches carried us to the spot which was to form the basis of opera-

tions, and here we were joined by the other detachments, consisting of a wing of one of the Royal regiments, two guns, and a company of artillery, and six hundred of the soldiers of the Rajah of Nagpore. There was a difficulty about the exact locality of Dowlut Sing and his formidable band of brigands. His movements, like those of the Mahrattas generally, were swift and secret, and there was no likelihood of his giving us the opportunity of engaging him in the open field. Our major, therefore, determined to scatter his command, directing one portion to the northeast, another to the northwest, while he advanced along the centre towards the north. In this way it was thought we might close round the portion of the country recently devastated, and at least gain information of the probable haunt of the marauder. The Nizam's detachment was broken in two, one part numbering two hundred and fifty cavalry and infantry, and the remainder accompanying the major.

The forward movement was made cautiously. The country people who were questioned as to the whereabouts of the chieftain, either did not know, or refused to say, or hazarded guesses for the sake of recompense. We were literally groping in the dark. At length, at break of day of the fifth march, we saw a cloud of dust rising in the distance, from whence we inferred the movement of a large body of men. Captain Fitzgerald, who commanded our detachment, ordered me to go forward with fifty troopers and reconnoitre. Evidently discerning our approach, the enemy adopted a similar move, and a body of at least two hundred mounted Pathans came forward at a rapid pace, and challenged us to fight. There was no time to retreat; but, as the ground was rugged and covered with brushwood, it would have been impossible for cavalry to act efficiently, and a hand-to-hand encounter, four to one, would have demoralized my detachment. I therefore sent off a non-commissioned officer to tell Fitzgerald how we were situated, and to ask for immediate reinforcements, in the mean while making with my men a rapid detour to the left to get into an open field where the wheat had lately been sown. We were quickly followed by the Pathans, a fine body of men, but badly mounted, and crowded without any order or system. Just as they were upon us, and we had got into the open, I wheeled round the detachment, and, giving the word to charge, we rushed upon a flank of the clustered multitude, and laid about us with right good will. It was a sharp encounter. The Pathans were good swordsmen, but fighting without order, and encumbered by their flowing drapery, our fellows had a double advantage over them. Sometimes they gave way in a body, retreated a few hundred yards, and returned to the contest. They had no firearms. We had pistols (old style) and good broadswords. The scrimmage had lasted a good half-hour, when the sound of the trumpet announced the arrival of Fitzgerald with succor. He fell headlong upon the rear of our "men in buckram," who now hastily went off to rejoin their main body, leaving seven men

dead and thirteen wounded on the ground. Our loss was one man killed and two wounded. I did not count in this a cut which I received in the left arm, as it was of small moment. Fitzgerald now gave orders for the pursuit of the enemy, as he saw in the distance Major Morrison coming up with the same design, while I was desired to convey the wounded of the enemy as prisoners back to our head-quarters. One of these men had been severely punished, and was suffering much from hemorrhage. I removed his *cummerbund* (a shawl which girded his person), and, tearing it in half, bound the pieces partly around his head and partly about his right thigh, where there was a frightful gash. Apparently touched by the attention, he said to me, "If you are pursuing the Rajah Dowlut Sing, you had better save yourselves further trouble and bloodshed, *for I am he!*" For the moment I was staggered, and believed him; but, aware of the craft and falsehood of the Mahrattas, I soon revoked my confidence, for I knew that Dowlut's followers would say anything to deter us from the pursuit. Before, however, I had reached the destination assigned to my charge and the escort, Fitzgerald came after us with six troopers and three of the chieftain's friends. Hearing of his fall, they had surrendered to Major Morrison, and obtained leave to search for him among the dead. He had led the reconnoissance in person, and "foremost fighting fell," covered with wounds. Fitzgerald would not give him up, but sent word to the major of the facts of the case, and took him and his followers to our camp. The recognition of the Pathans was affecting. One of the men was Dowlut's foster-brother, and wept bitterly on beholding his sad condition. Morrison, in the mean while, had received the submission of some of the leading Pathans. Many who held out were cut to pieces by the cavalry, and the rest fled in disorder.

We returned by slow marches to Hyderabad, to receive congratulations on our success. The question of the reward raised a little controversy. The capture of the chieftain was less a piece of meritorious gallantry than one of the accidents of war, and none of us felt disposed to claim it exclusively. Ultimately it was divided equally on the prize-money principle of allotment, and as the Zeminders (landholders), whose property had suffered the greatest damage from the incursions of Dowlut Sing, supplemented the published award with considerable *largesse*, each individual of Morrison's command had a pleasant addition to his month's pay. My own share was seventy-five dóllars.

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The year 1824 was, militarily, an eventful year in the annals of British India. In the first place, the Anglo-India army was doubled in strength; in the second place, a war broke out with the neighboring kingdom of Burmah; and in the third, there was a serious mutiny of a Sepoy battalion, ending in a fearful massacre.

I am not called upon to enter into particulars regarding the first two incidents, though they bore more or less directly upon the third. An expedition, upon a large scale, was ordered to proceed to Rangoon, the chief port of Burmah, to demand reparation for serious wrongs alleged to have been done to the interests of the India Empire, and in default of reparation to invade the kingdom. Among the troops detailed for service in Burmah was a Sepoy regiment, composed of Bengalese, and numbered the Forty-seventh. The Sepoys refused to embark, upon the plea that their religious usages prescribed a daily bath in fresh water, and a place for cooking their food away from the locality of Christian culinary operations. The plea was held to be untenable. They had enlisted for general service. Water would be provided for them, and they could boil their rice in a part of the vessel which should not be polluted by the white man's foot. Still they hesitated. There were malcontents among them who hoped, by encouraging stubbornness in others, they would escape service abroad. But the government was obdurate. Sepoys had, in earlier times, gone to Egypt, to Persia, to Arabia, to Java, to Mauritius, and had not lost caste thereby. The Forty-seventh, nevertheless, held out. The day for embarkation had arrived. If one regiment was allowed to have its own way, others would follow the example. The danger was imminent. Sir Edward Paget, the commander-in-chief, was a man of resolute character. He determined to bring matters to an issue. Having obtained leave from the Resident at Hyderabad to join the force going to Burmah as a volunteer, I had been placed temporarily on the staff of the adjutant-general, and was thus interested in the event of the hour. The Forty-seventh native infantry was stationed at Barrackpore, sixteen miles from Calcutta, the headquarters. It was ordered to parade the next morning at daybreak. I was dispatched to the colonel of the Forty-seventh Royal Regiment of *Europeans*, directing him to march the corps at midnight to Barrackpore, and bivouac on the parade-ground. The same order was sent to the artillery at the Dum Dun cantonment, twelve miles off, and one hundred cavalry troopers, forming the governor-general's body-guard, were likewise held in readiness. The morning arrived. The commander-in-chief and staff came upon the ground just as the several regiments took up their stations. The Sepoys were then addressed in their own language, through their own officers. Would they march? If not, move forward and "ground arms." The order was obeyed. "Right about face." They returned to their first position. Again they were asked, again exhorted, entreated; then threatened. They were in a state of mutiny. An example must be made, or the whole army would rise in rebellion. There was no alternative. At a signal from the commander-in-chief the European infantry raised their muskets,—a volley was fired upon the recusants. Many fell dead; the rest, scared,

ran from the ground; they were pursued, fired upon, or bayoneted. Those who escaped were tried by court-martial and hung. The name and number of the mutinous regiment was effaced from the army-list. Much agitation prevailed in India; much indignation was expressed in England. The subject was discussed in Parliament, and the retributive act of Sir Edward Paget was denounced as a useless massacre. But he had saved the empire. He had only used the powers which the law had given him for exercise in great emergencies, and the verdict of the country was pronounced in his favor.

The expedition now proceeded on its mission to Burmah. Lord Amherst, the governor-general, found that he had a harder nut to crack than he had expected. The Burmese offered a stout resistance. The climate of the swamps aided them in decimating the European visitors. But patience, reinforcements, and able commanders brought the war to a successful issue after it had lasted two years, and the King of Ava had to surrender much valuable territory and the command of the seaboard to the power he had provoked. Associated with Henry Havelock, then only a lieutenant on the staff of General Cotton, I remained for a few months with the army, but, being wounded when storming a stockade, and otherwise affected by the malarious atmosphere, I resigned my position and returned to Hyderabad, only, upon my recovery, to relinquish a career which promised neither glory nor provision for old age. All this took place in 1824–25. At the close of the latter year I returned to England to visit my family and friends, but was soon invited to occupy a responsible civil position in India, in connection with the army, and this office I held until 1843, when I left the country, and became a military journalist in England.

The rest of my story would have but little interest for those who can only relish details of actual professional service.

J. H. Siddons.

THE NAVAL POLICY OF THE UNITED STATES.

DOUBTLESS, on reflection, it will ever be a readily-accepted aphorism of right thinking, intelligent people, that commercial intercourse between the members of the great family of nations—embracing all Christendom, at least—is as much the fundamental base of all that constitutes the well-being of each separate nation, as is the social intercourse of individuals to the life and happiness of any village community. Social relations, too, comity, and the observance of consequent correlative rights and obligations between the nations, are all of pronounced necessity, equal to what exists between individuals in the domestic organization of ordinary rural society.

But it is an undisputed inherent property of mankind, inuring throughout all ages in the past, and inevitable for all time to come, that individuals, as a rule, are prone to positive preference for *themselves*, in all *temporal* things affecting their relations with fellow-men, which rule applies equally to the institutions of men; to nations of the world the same as to individual members of plain municipal corporations.

So positive, indeed, is this paramount proclivity of man's nature, of which nations partake in a like degree, to arrogate and presume more or less by consequence of mere physical strength, that all the experiences of past ages point to a never-ceasing necessity for powerful restraining influence, in that respect, to prevent encroachments of the strong upon the sacred rights of the weak.

That long looked for happy millennium, when men and nations shall bow in meek willingness always to the instincts of moral impulse, or moral suasion; when they shall voluntarily and nicely observe, in their relations to one another, the vitally essential principles of *meum et tuum*, is practically as far off to-day, after all, as it was in the time of Grotius.

The subject of policy, therefore, with reference to its physical capabilities for maintaining individuality, and compelling the respect of its confederates in the great league, must be considered as inseparably connected with a nation's purposes, and affecting its motives under all circumstances and conditions of its existence.

Assuming that all the prerequisites of such power are truly existent in us, and so recognized abroad, it is not extravagant to predict, now, that the United States, as a nation, impelled by its rapidly-increasing prosperity, and the steady spirit of enterprise, characteristic of its people, will not only soon regain its lately lost status of commercial importance, but, in that respect, if wisely sustained by its naval policy, will, probably within the next generation of men, outstrip every member of the grand fraternity. Meanwhile this growing commerce, extending into the remotest regions of the world, is at no time safe from molestation, or depredations, incident to the inherent evil propensities of mankind everywhere, except it be assured of protection, and quick redress of any perpetrated wrongs.

What, then, shall be the guarantee of proper protection to such a commerce as is expected for the United States of America, while our navy, now so inadequate, by the supineness of legislation, is fast falling into irretrievable decay?

To begin now with the real subject of our naval policy,—to whom shall we preach it? Ay, to whom may we look, in these days of endless mere party wrangling, and petty domestic squabbles, for any enlarged and liberal views of the nation's exterior policy? Shall it be to those politicians who are absorbed only in the thoughts of how to impress their constituency of their immaculate patriotism, by blindly, nonsensically, and noisily advocating, and howling, "retrenchment! retrenchment! retrenchment!" everywhere, and in everything, without any rational discrimination of, or just reference to, cause or effect? They seem ever ready to devise schemes for reorganization (?) of the army, or the navy; to the end, alas! by specious display, that the dear Buncombe County constituency may be lured into the comforting belief of being thus, in great measure, *saved the expense* of such, to them being supposed, now *useless appendages.* And it is not to be wondered at, altogether, to what extent they do succeed; alas for Buncombe County! Now we earnestly pray that some truly good and wise statesmen may yet be found, ere it shall be too late, and awakened to the urgent dictates of our nation's naval policy.

In some respects the navy would crave to be *let alone* by the politicians. It has to deplore, not infrequently, the pernicious meddling of a certain class of them, and their legislation *likewise.*

That unfortunate feature of existing law is being greatly deprecated, which practically precludes the utilization, for naval purposes, of our worn-out ships, and old material of every description; which requires that the proceeds of sales shall be turned into the national treasury.

It was manifestly a most unwise measure of legislation that thus alienated, from its natural belonging, so considerable a means for repairing and retrieving. Turned into that capacious vault,—*pro bono publico,*—the sum of all the sales is as a *drop in the bucket,* and is lost, for

all practical advantage, to the navy; whereas, *but for the law*, a properly constituted board of admiralty would now advise such management and conversion of this property, or its proceeds, as would avail to the full extent of its intrinsic value, directly in the source from which it has been so unwisely diverted.

No man of ordinary perspicacity, in or out of Congress, can fail of being quite sensibly impressed, on a little serious reflection, by the very pitiful spectacle, apparently on the eve of being revealed to the world, of this most prosperously aspiring—and pretentious, too—of nations without a navy! without any visible means for protecting that commerce, to *expectations* of which, all of its stupendous greatness chiefly refers.

We have no right to expect that other nations will contentedly maintain an active police everywhere upon the seas, for our benefit in common with theirs, when it shall have been observed that we do meanly dodge the moral obligation of our part, from *calculation*, motives of economy, or heedlessness.

In the interests and real necessities of commerce an adequate navy, to command at all times a proper respect for our flag abroad, might be maintained, by cleverly-devised scheme, without any appreciable cost whatever to the individual tax-payers of the nation. But it is not the purpose of this article, however discursive, perhaps, to treat of that subject; albeit, assuredly, it needs no elaborate argument, nor long process of reasoning, to show the reciprocally dependent relations to each other of the commercial and naval policies of our nation.

Hand in hand together, the one is a positive necessity to the other; for, without a commerce the navy would not be needed; without a navy commerce could not exist. But commerce is a paramount necessity to the nation, and the navy is indispensable for its protection.

Commerce must ever look to, and be dependent upon, the navy for its immunity from molestation and that sense of security, abroad, which is absolutely indispensable to its thrift.

It is proposed, however, in this discourse, to have particular reference only to what ought to be embraced in our present naval policy.

Every possible element of argument—uniting the very persuasive features of common sense, moral perception, expediency, and great necessity—urges the immediate resuscitation of our navy from its present starved and moribund condition.

Prudent policy suggests employment, of incalculable importance to the civilized world at large, for a just quota of our own cruisers in the grand objects and interests of scientific research, everywhere. Aside from the essential interests and demands of its own more and more widely extending commerce, positively requiring that an ever-watchful and efficient police shall be maintained upon all the seas and coasts of the world, our nation is expected, and is morally bound, to contribute

fairly to the cause of general practical knowledge in the proportion to its means.

This it is known to possess pre-eminently, in respect to the diversified capabilities of its naval officers. It is true, we may continue for a while, yet, without positive disaster, perhaps, to evade this moral obligation in the face of true policy. But is it justifiable upon any grounds of reason whatever?

Coeval with the growth of our own greatness is the growth of our greater need for cruising ships.

To be commensurate with its high dignity,—having reference to that assured commercial prosperity which might be predicated of proper protection, and its vast wealth of native resources,—the nation wants a largely-increased number of naval ships, of modern approved types,—availing of the important results of all the recent expensive and exhaustive experiments of its neighbors,—and more men, of course.

Wise policy, in view to a true and proper economy, would dictate the immediate development of certain projected improvements to our naval establishments, everywhere,—as instance the water-front of the Boston Navy-Yard.

It should be urged, as a matter of essential importance to the nation, that its navy-yards, always under thorough naval discipline, be wholly controlled by authority derived directly from a properly-constituted board of admiralty.

It is a condition here premised, and confidently affirmed, that such an intermediary and advisory organ of naval administration as is proposed in a board of admiralty, "commissioners," "board of survey," or by whatever title it may be designated, having unlimited supervisory jurisdiction over everything that would be constructed, or equipped, for naval purposes, would infallibly fix responsibility, in a manner and place, effectually to assure the nation against any possible recurrence of such abuses, or egregious mistakes, as are alleged of times past.

Under this system of management a most explicit and satisfactory account would be regularly rendered for every dollar appropriated to its uses, and for every dollar expended would be realized *to the navy* its proper *quid pro quo*.

It is a proposed feature of policy that is pre-eminently urged, to make the navy fairly answerable to its legitimate purposes, and the nation's expectations; to restore normal habits of tone, integrity, *esprit de corps*, and thorough efficiency,—all of which would result by the judiciously-persuasive influence and management of such an advisory power.

A kindred subject to this, of the nation's naval policy,—indeed, it is identical in effect,—"the purposes of a navy, and the best methods of rendering it efficient,"—was most ably and satisfyingly treated of by Rear-Admiral Ammen and Lieutenant Frederick Collins, in their ex-

tremely valuable papers, which were read at meetings of the Institute, respectively, on the 13th and 27th of February, 1879. The arguments embodied in those papers should indubitably commend themselves to the most lively consideration of such liberal-minded, earnest men in our national Congress, as will grasp the situation, and be actuated by motives so obviously demanded of them as legislators, for the true interests and needs of the nation.

And these same liberal-minded, earnest statesmen will find subject for serious thought, and wise action, if they will perchance, somehow, happen to look a little into the probable near future, with reference to the manner of *manning* our navy. It will be obvious enough to them that a most liberal policy for educating and training boys—under the admirable system now fairly inaugurated—is urgently needed. The conditions, or features, of that system already begun,—in a very small way, compared with our great and growing necessities,—should be quickly enlarged to proportions more in consonance with the situation, whereby hundreds of healthy boys, in our large communities, would be redeemed from sometimes otherwise hopeless vagabondism, or worse, and made not only respectable, but practically the most essential element for the ultimate success of our aims.

It is the only prolific source by which the nation can assure itself of well-trained *American* seamen, and gunners, for its navy,—an element so vital to its purposes. To meet the inevitable wants of that near future, in which we indulge but reasonable and natural expectations, there should be now certainly not less than five thousand healthy, intelligent *American* boys—and a wiser policy would double that number—under such training as is now afforded by the system that has already exemplified its efficiency and incalculable benefits.

In conclusion, besides, it may be regarded a desideratum, that this system would lead ultimately to a prevailing use of the *Anglo-American* language, somewhat to the exclusion—in ordinary drills, at least—of Chinese and other heathen tongues in our ships of war.

GEO. M. RANSOM,
Commodore U. S. Navy.

November 29, 1879.

JOSHUA'S RELIEF OF GIBEON AND BATTLE OF BETH-HORON.

"The most important battle in the Sacred History."—DEAN STANLEY.

"Sun, stand thou still upon Gibeon!
And thou, Moon, in the valley of Ajalon!"
Book of Jasher.

To institute a simile between greater things and less, the Bible is a reservoir from which the most varied instruction may be drawn, just as from the earth underlying Saratoga, springs gush forth endowed with sanitary powers adapted to the most opposite diseases. This "Book of Books" contains lessons not only for the conduct of every-day life; for the finite and the infinite; for the development of morality and the blessings of peace; but even for the scientific carrying on of war. One of the lights of military science in the last century (Folard) found in Joab's dispositions at Medeba (B.C. 1037) the first suggestions for a battle like that of Telamon (B.C. 224), which latter had always been considered the original type of a class of conflicts of which our Chancellorsville (1863) was a faint expression. With variations and divergences, this category is not so restricted, however, as a mere cursory survey would disclose. The conflict in which Judas Maccabæus fell (B.C. 161) was somewhat like our first battle in the Virginian Wilderness; and in the engagement (B.C. 144) between Jonathan, brother of Judas, and the Princes of Demetrius, the Jewish leader had the troops under the latter in his front and those of the Nabadeans in his rear, yet, in turn, he completely defeated both. At the siege of Alesia (B.C. 50), Cæsar, with fifty thousand Romans, was blockading a town held by eighty thousand Gauls, when he himself was surrounded by over two hundred thousand Confederates of the same race as the besieged. He defeated the enormous masses who were attempting to succor the place, and then compelled Alesia to surrender. In 1639 Turin witnessed a *quadruple* siege: The French garrison in the citadel of this capital (I) was beset by the Piedmontese and Spaniards (II), under Prince Thomas of Carignano. The latter were again invested by the French army (III), under the Duke of Harcourt, and these again were surrounded by the Spaniards (IV), under the Conde de Leganes. This state of things lasted

about four months and a half, when the Spaniards beat the French. At the siege of Belgrade, in 1717, Prince Eugene was similarly circumstanced; nevertheless, he utterly defeated the Turkish army seeking to relieve the fortress, and then compelled this stronghold to surrender. Finally, Frederic and Ziethen's Torgau, in 1760, is another fine example, and in 1810, at Albuera, the British General Stuart had to face both ways, and was victorious over the veteran French simultaneously attacking his front and rear.

Some of the military leaders of the Jews, for ability and success, rank among the great captains of the world. Moses was an originator, as well as a commander, like Gustavus Adolphus; Joshua was a thunderbolt, like the Bonaparte of 1796–97; David was a type of Scharnhorst and Stein, the inaugurators of Prussia's conquering Landwehr system; Judas Maccabæus, a master of the "offensive-defensive," like Frederic the Great; while Uzziah stands prominent in the highest rank of military engineers, administrators, and tacticians. This list might be greatly extended.

In the same way that it has been very conclusively shown in a recent work of extraordinary power and research—"Judaism at Rome" —that the best of the Pagans of antiquity, the Stoics, derived their grandest virtues and best convictions, their morals and their monotheism, from the Old Testament, in like manner it is claimed that many ancient chiefs of the highest renown drew their military inspiration from the same source. Lecky, in his famous "History of European Morals" (i., 345), tells us "even Miltiades owed his military skill to an assiduous study of the Pentateuch, and the ambuscade by which he won the battle of Marathon was imitated from the strategy of Moses." "As in the battle of Marathon, everything depended on the suddenness of the blow which should break in pieces the hostile confederation." "As often before and after, so now, 'not a man could stand before' the awe and panic of the sound of that terrible shout" of a dauntless host, arriving with the assurance in themselves and the divine promise of victory.

These brief military allusions will serve as an introduction to the consideration of "the most important battle in Sacred History,"—the culmination of Joshua's short, sharp, and decisive campaign against the five confederated Amorite kings, B.C. 1450. Its careful consideration is of the more consequence because an honest investigation will in a great measure remove the obscurities that invest the tradition of "the standing still of the sun and moon," a—miracle, so styled, which has always been one of the most ready arguments against the truth of the Bible, and a perfect battering-ram for unbelievers in their attempts to breach the veracity of the Old Testament.

After the passage of the Jordan, the capture of Ai, or Hai, and Jericho,—the first a little over ten miles N. by E. of Jerusalem, both

important strategical posts commanding the eastern entrance into the natural route up from the Plains of the Jordan into the heart of Judea, —and the submission of Gibeon, six or seven miles N. N. W. of Jerusalem,—after these decided successes, the five Amorite kings of Jerusalem, Hebron (twenty miles S.), Jarmuth (about the same distance S. W.), Lachish (twenty-five miles S. S. W.), and Eglon (thirty-five miles S. W.) entered into a league to attack Joshua before he could occupy Gibeon, not only important in itself as another strategic key-point, but of vital importance to the security of the table-lands and highlands constituting the rich possessions of the confederates. Jericho and Ai, the keys of the "Low country" to the East, having fallen into the hands of the invaders, Gibeon—on, or overlooked by, Neby-Samuel, two thousand six hundred and forty-nine feet above sea-level, and a larger and more populous stronghold than either of these—must not be permitted to pass into the possession of a strange enemy as dangerous to the Phœnician races in Palestine as the "Shepherd Kings" and their hordes had proved to the older and stronger semi-barbarous civilization of Egypt.

Justly alarmed at this coalition to avenge their defection to the Israelites, the people of Gibeon sent advices to Joshua in his camp at Gilgal. This noted place was twenty-five miles E. by N. of Jerusalem, a few miles southeast of Jericho, and five or six miles west of the Jordan, at Bethabara ("the House of Passage"), where this river-bed had been crossed dry-shod. Joshua comprehended the situation at a glance, and acted with equal decision. He left the non-combatants of his immigrant host under a strong guard at Gilgal, in the "Plains of Jericho," and with his picked troops made a vigorous night march from the valley towards the West and into the mountains, realizing the magnificent imagery of the prophet Jeremiah,—"Behold, he shall come like a lion from the Swelling of Jordan unto the habitation of the Strong." By this celerity and surprise Joshua interposed his army between the Five Kings and their base, the mountain country to the southward, and turned them so that his troops enveloped their rear completely or in part, taking them in flank and in *reverse*, just as they were advancing in fancied security to the certain chastisement of Gibeon. This promptitude and force is what is vulgarly styled "Napoleonic," but these are characteristics of all great generals. Suwarrow, an original in all things, in his famous "Discourse under the Trigger," styles it "falling unexpectedly upon an enemy '*like* NOW *on the head!*'" The Great Elector's Campaign of Fehrbellin (1675) against the Swedes was a perfect antitype of Joshua's successive, almost continuous, four-phased battles of Gibeon, the two Beth-Horons, and Ajalon.

The sudden onslaught of Joshua recalls an incident in the life of Turenne which affords some idea of the effect of a surprise such as that of Joshua. Turenne had advised his colleague, Marshal Hocquin-

court, that his dispositions in front of Briare and Gien exposed him to surprise, but finding that the advice was offensive he did not press it, since the generals commanding against the royal forces had neither skill nor enterprise sufficient to take advantage of the situation. The same night, 7th April, 1652, Turenne was aroused by volleys and cries of distress. "Boots and saddles" was blown, the infantry assembled, and Turenne hastened to support his imprudent colleague, whose self-confidence had been thus rudely shocked. Ascending an elevation, he discovered that several villages wherein Hocquincourt's troops had been quartered had been set on fire, and by their light he saw that five out of seven had been already carried with great loss and general rout. Intuitively Turenne seized the situation, and exclaimed, "CONDÉ *must be come!*" Thus is it possible for one great genius to discern another in his works, and thus is the presence of a hero already discovered by his exploits before he himself is recognized as present. "It was truly indeed the great Condé, who, transported as though by enchantment from the further extremity of France, had brought back victory, and was heralded by her."

In the same way Joshua revealed himself in the blaze and daze of victory to the Five Kings of the Amorites before Gibeon. His first attack, the first *phase* of this complex conflict, early in the morning, was so unexpected and impetuous that the enemy was completely broken up. One portion fled like many in the Eleventh Corps at Chancellorsville, and another retreated precipitately. Besides these, there were still many who, with warrior intuition, perceiving that all direct escape was cut off, and animated at once with the military instincts of a brave and warlike race, as well as the courage of despair, endeavored to defend each successive step and pass of the mountains. Thus they hoped to retard the victors and perhaps eventually evade pursuit northwards into the territories of the more northern and friendly kings of Canaan, against whom Joshua was compelled to move, after this campaign for the subjugation of the Southern country. The Five Southern Kings themselves fled, and, by a long circuit through amicable territory, sought to regain their native seats, or temporarily conceal themselves in one of the subterranean retreats in which these mountains abounded,[1]—the "Cave of Makkedah," supposed to have been about eighteen miles S. S. W. of Jerusalem, and some three miles S. E. of that of Adullam, where David found a similar refuge when pursued by Saul.

Judging from parallel cases, these kings were mounted either on swift dromedaries, or on horseback (see the Ninevite Tables), or in chariots. Cavalry, common sense assumes, must have preceded charioteers. Thus they were enabled to get off in safety, although doubtless fol-

[1] Renan, in his "Église Chrétienne" (Chapter xi. and Appendices), says that during the last revolt of the Jews (A.D. 132–5) it became almost a subterranean campaign,—"a war of moles."

lowed up by swift detachments piloted by guides furnished from Gibeon, and perfectly acquainted with the intricacies and paths of the hiding-places of the neighboring mountains. The Gibeonites were a very cunning and "hatefully revengeful" race. It is not unlikely, in the course of the wanderings of a generation, that the Jews may have organized a corps mounted on swift "Heiries." Many of the ancient and modern nations of the East maintained such. They were attached to the armies of Semiramis, Cyrus, Xerxes, etc., and, within the century, the Shah of Persia's artillery were mounted—guns and men—on camels. Napoleon organized a similar corps in Egypt, and the Kalmuck-Camel-Riflemen, in the famous Exodus of their nation, in 1771, from the Volga to the Emba (Djem, enters Caspian), covered the retreat, and almost alone of themselves baffled the previous pursuit of the Russian Troops of the Line and Irregulars.

Meanwhile the rout of the Amorites and their slaughter by the Israelites rolled up the mountain-range which separates the low country to the east of it, towards the Jordan and Dead Sea, from the slope and plains sinking westward to the Mediterranean. Whoever will take the trouble to examine the best maps and descriptions of this country will note two peculiarities. Whoever from the East attempted to ascend towards Jerusalem (Gibeon) had to follow the path of Jericho, to which Jericho itself was the key. Whoever had to descend from Jerusalem towards the West had to follow the route of Beth-Horon ("House of Caves"). This Pass begins towards the Mediterranean at an ancient fortress (sixteen hundred and sixty feet elevation, known, doubtless, among the Crusaders as the "Castle of the Penitent Thief," *Castellum Boni Latronis*, now Lodroon) and ends at what, in mediæval times, was styled Mount Joy (*Mont-Joie*), because at this point the eyes of pilgrims are first made glad with the aspect of Jerusalem. It is a little west of the fortified town of Gibeon, at an elevation of two thousand six hundred and forty-nine feet,—about four hundred and fifty feet higher than the "Holy City." It is now known as Neby-Samuel, since Moslem tradition identifies it as the burial-place of the prophet. Here it was Richard the Lion-Hearted buried his face in his gauntleted hands, as unworthy to look upon the sacred city which it was impossible for him to rescue by force of arms from the infidel. Thus the scene of Joshua's slaughter of the Amorites, and the Miracle, so styled, lay between Ladroon and Mount Joy. Traces of a Roman road are still to be found between Lower (*Beit'-'vr-et-Tahta*) and Upper Beth-Horon (*el Foka*), some three miles, or an hour's march, apart.

Now, bear in mind that Joshua had made a night march of some twenty miles through a country utterly strange to him, and destitute at this time of what are esteemed roads, and fought a battle in the morning. From the battle-ground near Gibeon to the Pass, proper, of Beth-Horon is ten or twelve miles. Whoever has visited the Holy

Land is well aware what a difficult country it is to travel over, even in small parties, and with all the modern appliances of tourists. Ibrahim Pasha lost a great many men in forcing his way through this very Pass on his advance from Jaffa to Jerusalem, although his troops were veteran regulars, fresh from victories over the Turks, and its defenders were the imperfectly-armed inhabitants of the country. Here it was, also, that Bar-kokaba, the celebrated Jewish impostor and generalissimo, defeated with such great slaughter the Roman legions attempting to force the Pass on their advance to the siege of Jerusalem (?), in the reign of Hadrian, about A.D. 132–34. Bether, in which he held out for three years, is considered by some as built on the site of Upper Beth-Horon, and the Jewish statement of the slaughter which followed its capture exhausts Eastern hyperbole. One writer goes so far as to add that the torrents of blood rose to the nostrils of the Roman horses, and bore away corpses through the channels draining the Valley of Ajalon, even into the sea. Here, likewise, the Roman army under Cestius Gallus (A.D. 66) was almost totally destroyed by the Jews. Some locate in the same spot the successful defeat and pursuit of the Five Kings by Abraham. A portion, if not the whole, of Pompey's troops advanced up this road to his conquest of the Holy City (B.C. 63). In these passes Judas Maccabæus smote Seron, the Syrian general (circa B.C. 166), and at Adasa (I. Mac., vii. 39–43), only four miles away, he discomfited another Syrian army and slew its commander, Nicanor, so well known through the "Familiar Quotation" (II. Mac., xv. 28), "Nicanor lay dead in his harness."

Lower Beth-Horon was always a place of importance, commanding the wild, winding ravine through which the route ascends from the fertile plains upon the Mediterranean to the more severe mountainous district styled the "Hill Country of Judea." The entrance to this Pass from the Gibeon (*i.e.*, Jordan) side is about two miles east from Upper Beth-Horon. Approaching this Pass, as the pursued and pursuers did, it seemed like a vast dark cavern gaping to swallow the multitude, especially since the mountains tower on either side to a great height. Captain Lynch, U.S.N., who ran a line thirty-three miles from Jerusalem to the sea-coast, speaks of this road as frightful; and, from his language, it would seem that the Pass of Beth-Horon is two thousand five hundred feet above the Mediterranean. This is nearly the elevation of the Catskill, "Pine Orchard," or Mountain House.

While the rout and slaughter and pursuit was rolling and seething like a resistless torrent up, into, and through this ravine, there arose one of the tremendous hail-storms which often lay waste whole districts and ruin villages in Syria and Asia Minor. They are attended with clouds of intense blackness, and in different localities have been known to discharge ice-balls three to four inches in diameter,—sometimes much

larger,—weighing from an ounce to fourteen pounds. A hail-storm which occurred in northern Dutchess County, New York, in June of this year,—1879,—afforded some idea of the powers of destruction with which hail-stones are invested, although none exceeded the size of hen's eggs, and the majority were not much larger than walnuts. Bohn's Folio Bible Dictionary states that such storms are frequent in Palestine and the neighboring regions, and especially severe in the mountainous districts and along the coasts. In the elevated region of northern Persia similar storms are frequently of sufficient violence to destroy cattle in the fields. Commodore Porter, U.S.N., describes a terrific hail-storm on the Bosphorus in the summer of 1831, by which men and animals were killed, bones broken in abundance by pieces of ice, which appeared to be as large as the globes of large-sized water-decanters. The commodore says, "Up to this hour, late in the afternoon, I have not recovered my composure; my nerves are so affected as scarcely to be able to hold my pen, or communicate my ideas. The scene was awful beyond all description. I have witnessed repeated earthquakes; the lightning has played, as it were, about my head, the wind roared, and the waves have at one moment thrown me to the sky, and the next have sunk me to a deep abyss. I have been in action, and seen death and destruction around me in every shape of horror; but I never before had the feeling of awe which seized upon me on this occasion, and still haunts, and I feel will ever haunt me." About midnight, 28th March, 1834, a hail-storm of only ten minutes' duration at Jackson, in Louisiana, killed large numbers of cattle.

Imagine such a storm as Commodore Porter describes, but of intenser severity, bursting on the terrified multitude of fugitives, whose nerve-force had been exhausted in a protracted battle and through the additional horror of the catastrophe occurring in such a frightful compressed mountain cleavage, dark in spots even at mid-day under a burning Syrian sun. Doubtless while it lasted it arrested the pursuit, and those of the Amorites who escaped the sword and the hail took advantage of the respite to double on their tracks, and instead of turning to the right, northward, wheeled southward and homeward, thus prolonging the pursuit and their agony. Such a hail-storm (B.C. 1296) may have suggested the verse of Deborah's "Song of Triumph." "They fought from heaven; the stars in their courses fought against 'Sisera.'" Neither then (B.C. 1296) nor over two centuries previous (B.C. 1451) did it require miraculous agencies for its production. Its fortuitous occurrence alone renders it astonishing to the true philosopher.

To any one ascending a steep mountain from the eastward, the sun sets long before it would appear to do so to another moving on a plane, and the shadows of evening would seem in the first case to settle down much earlier upon a mountain gorge, without needing the intense dark-

ness of a terrible storm to make soldiers, who had been marching all night and fighting for half a day, believe that actual night had come on. It is scarcely possible to express the appalling obliteration of light that may result from a sudden superlative storm in a mountainous country. It is almost as quick and startling as a transformation scene in a pantomime. The very season changes on the skirts of a hail-storm; this very summer the thermometer fell between twenty and thirty degrees in about as many minutes. In a hot country like Syria this is almost equivalent to exposing an overheated and exhausted man to mortal cold. Captain Lynch emphasizes this in his "Expedition to the Dead Sea" (383), and records that in a few hours he materially "changed our climate;" adding, "There is, perhaps, no greater trial to the constitution than sudden changes of atmospheric temperature. We were so enfeebled by the heat we had experienced in the chasm (now) beneath us, that, at the temperature of sixty degrees, the air here (in the elevated region attained) felt piercingly cold." Byron, however, in a single verse of Childe Harold paints the scene to very nature:

> "The sky is changed! and such a change! Oh night,
> And storm, and darkness, ye are wondrous strong,
> Yet lovely in your strength, as is the light
> Of a dark eye in woman! Far along,
> From peak to peak, the rattling crags among,
> Leaps the live thunder! Not from one lone cloud,
> But every mountain now hath found a tongue,
> And [Hermon] answers through her misty shroud,
> Back to [Beth-Horon's peaks], who call to her aloud!"

Were it not for watches, soldiers in battle would take no notice of time, and even with watches, what discussions occur as to the hour of certain incidents of a conflict. Take the disputed hour as to the arrival upon the field of Williamsburg of Kearny to the relief of Hooker as an instance in point.

It was, doubtless, on attaining the summit of the Pass of Beth-Horon, that with the clearing away of the storm-clouds, the sun, which had been lost to sight behind the mountains, displayed itself again to the Israelites as yet several hours above the horizon, for the descent westward was continuous and unbroken to the sea.

This unexpected reappearance of the sun and the daylight, protracted in consequence of the elevation of the ground occupied by the Israelites, may have suggested to them the idea of the sun and moon standing still at the command of Joshua. When the sunlight burst forth again upon the victors after the tempest, it may have seemed to shine, owing to the disposition of the breaking and whirling away of the storm-clouds, in the direction of Gibeon,—*i.e.*, to the southward,—on the loftiest peak of the region. This, therefore, was the most likely point to reflect the re-born radiance, while the moon hung lower down

in the western heavens, flooding with its silvery sheen the lovely and luxuriant valley of Ajalon and "Maritime Plain" to the westward. The "Round Top," or "Liberty Cap," the highest boss of the Kaatskills, often shows itself, thus illuminated, as a fierce storm is rapidly passing away. Furthermore, an observer of Nature, to whom the subject was referred, states that, in the course of a life, he has often seen the sun to the southward in the relative position of Gibeon, about three hours high, and a gibbous or three-quarter moon in the western sky, about an hour high, in the relative position of Ajalon, which would exactly explain the miracle, so styled.

It is said that verses 12, 13, and 14—perhaps 15—of Chapter x. of the Book of Joshua are in some sense interpolations. At all events, part of them is stated in the Scripture to be a quotation from the lost Book of Jasher. It is supposed to be a poetical suggestion, and in Townsend's Bible a portion is cited and printed as poetry. Now, if Bishop Lowth is correct, and the Book of Jasher was a Collection of poems, pure and simple, or an Anthology of Sacred Songs, what is more probable than that the whole account so cited was an image conceived in the highest strain of bardic rhythm and fervor?

This article is not written to cast the slightest doubt upon the occurrences of this day if they *were* miraculous, for nothing is impossible to God. Still, as scoffers and skeptics elect to make a stand upon this incident, it may relieve a great many weak minds to know that the locality, the climate, and a concurrence of natural events, in connection with a quadruple conflict ending in a great national triumph, might easily inspire, and in a measure, justify a poetical hyperbole, especially among Eastern people, so given, as a rule, to exaggeration. So much so, indeed, might this be the case, that by a figure of speech Joshua, victorious in battle, amid the churm of the elements and the cataclysm of human passions, might be represented as standing on the conquered heights and as commanding the Sun and the Moon to stand still as the grandest witnesses of his own great achievement, and as coadjutors in the crowning triumph of his genius and the valor of his people.[2]

Thus it was that Joshua may have exclaimed in the enthusiastic exultation of victory, as Job did in the depths of his despair, "Behold! my witness is in heaven and my record is on high!"

J. Watts De Peyster,
Brevet Major-General S.N.Y.

[2] There is a magnificent picture exhibiting Joshua on a pinnacle-rock, in an attitude which would indicate rather an appeal to the orbs of day and night as witnesses than as if commanding them. Examine Robinson's "Biblical Researches in Palestine," iii. 64, etc.

UNA NARIZ.[1]

AN ANECDOTE OF THE CARNIVAL.

(Translated from the Spanish of Breton de los Herreros, by T. A. Lyons, Lieutenant U.S.N.)

"WILL you permit me to sit beside you, serranita?"

"With much pleasure,—and I am even grateful that you prefer me to the many beauties that shed lustre on the assembly. You know me, perhaps?"

"As yet, no; and it is quite possible I should not, though you were to remove the mask. But what does that matter? To-night we can begin an acquaintance and friendship, if you wish; those that are made at a mask-ball are not always the most unpleasant."

"Neither do they often fail to prove very deceptive."

"I do not deny it. I have suffered some grievous disappointments, but——"

"And caused them, too, no doubt."

"No. One accustomed to go everywhere, even to the entertainments of carnival time, without a disguise, can practice imposition but little."

"Indeed you have no reason to hide your face, and the same cannot be said of every gentleman."

"Thank you, lovely serrana; you know me, then?"

"Yes, by sight. I have heard you are a poet; will you favor me with a few verses?"

"I will, if you desire them; for I have always prided myself on being complaisant towards ladies. But, first, I must know your name."

"Assign me one at pleasure,—Filis, Laura, Filena,—any one you think poetical. At all events, I should not tell you my real one,—only the first that occurred to me,—therefore it is best that you yourself should make the selection."

"But without at least seeing the face whose beauties I am to extol,—without knowing the sweet object of my inspirations——"

"That from a poet! You who soar into the illimitable regions of

[1] A nose.

the ideal, what necessity can you have for the actual presence of the object of your worship? Besides, I do not estimate my face so highly, nor do I deem your imagination so sterile, as to venture to unmask."

"True, we poets—since you are so kind as to count me among their number—are accustomed to have our thoughts wander in imaginary space, but we do not feed solely on illusions; and for myself, I must tell you that in matters of pleasure I am and always have been for the positive, the tangible, the real."

"And what pleasure do you promise yourself by seeing my face?"

"That of admiring it, if pretty, as I am sure it is; that of adoring you——"

"Always adoration on the lips! You poets deserve to be banished from every Christian country."

"And why, my sweet one?"

"If you speak from the heart, for being impious idolaters; and if not, for being hypocrites. You do well to come without a mask: poets do not need it to deceive,—they always have it on."

"If that be true, I accept with pleasure a quality that likens me so much to the fair sex."

"Are we, then, such dissemblers?"

"Yes, my pretty little mask. As regards that, you cannot say that we accuse you without good grounds; but it must also be confessed that the distrustful and exacting nature of man causes your want of sincerity, and that, for the most part, your artifices are pardonable, since it is the desire to gratify us that prompts them. But is it not possible for me to see your face?"

"It cannot be; '*the desire to gratify you*' impels me to retain the mask."

"Your conversation charms me,—every word but intensifies my impatience to know you."

"And yet you must actually see my face in order to believe it beautiful! From the first have you not called me '*the sweet object of your inspirations*'? Believe me, then, your interest and mine are opposed to the act of condescension you solicit. While I remain masked I am sure of hearing flattering phrases, to which perhaps I am not accustomed. But once the protecting veil removed, good-by illusion! Stiff courtesy and cold seriousness will replace the eulogies, the endearing epithets, the tender sympathy with which you now hold me,—if not elated with pride and satisfaction, at least amused and happy."

"That modesty is to me the clearest proof of your surpassing merit."

"Indeed! Since I lack any other, I have, then, the merit of being modest, or, rather, sincere!"

"To believe yourself, it would not be difficult for me to mistake you for an ordinary woman. The carnival is but the reverse of the

picture of life; and yet many ladies who screen themselves with the silken gauze of the mask, which incites to fraud and deception, practice these much less with it on than off. They have so few opportunities of speaking the truth. But you,—you are not ugly; I could swear it. By the experience of past errors and deceptions I have acquired a certain tact,—a skill in judging those who hide behind a mask. I am not mistaken or gulled like a mere novice. Oh, but I have fine scent!"[2]

On saying this I noticed in my companion an expression either of surprise or disgust. I imagined that such a common phrase had sounded uncouth to her ears, and so I hastened to make amends by using a refinement of speech commensurate with her culture. But she, laughing heartily, pressed my hand, and showed with great delicacy and amiability that she freely pardoned so slight a slip of the tongue. I continued:

"For only one thing should I regret to have you unmask."

"And what is that?"

"It would not then be permitted me to address you in the character in which you now appear. Would it not be a pity to have to give up this caressing manner,—this delightful intimacy that the mask sanctions? At present I am speaking to you in the language of the closest friends, of brother and sister, of husband and wife,—of lovers."

"And yet were I to commit the indiscretion of removing the mask, you would quickly leave me, and have scarcely the civility to bid me a cold and rude '*good-night.*'"[3]

"What a pleasure to thus mortify me! Do you, then, think me capable of such discourtesy? Let us suppose for a moment that you *are* ugly—horrible; in quitting that mask, which distracts me, would that strip you also of the sweetness of your conversation—of that voice which bewitches me—of that affability which captivates—and that grace which charms me? How can a woman with such attractions be commonplace? Even if your face *is* ugly, I will overlook it."

"Think well of what you are saying. Can you be more indulgent than other men,—less swayed than they by self-love? To a man, plainness is the greatest defect—even crime—a woman can be guilty of."

"Oh, either I am of a different species or you slander our sex, serranita. Put me to the test,—untie that mask, so jealous of my happiness,—and you will soon see that, far from growing cold, my tenderness will increase. And do not think my proposition as rash as you imagine. Where can that excessive homeliness be with which you pretend to frighten me? Do I not see the exquisite elegance of your form? Do I not press your beautiful hand? Does not your pretty little foot tantalize me? Does not the palpitation of your snowy bosom indicate other fascinations equally irresistible? Does not the

[2] In the original, *Tengo yo buena nariz*,—literally, I have a good nose.

[3] In the original, *A los pies de usted*,—literally, At your feet.

brilliant lustre of your black eyes fix my gaze? Those glossy tresses of ebony, which form such striking contrast with the pure whiteness of your throat,—whose can they be but yours? And is my adroitness so little that I have not been able, in the movements of your head, to catch a glimpse of your sweet, smiling lips?"

"Yet, with all those perfections, which you so highly prize, I assure you that I am indeed a fright,—that you will be transfixed with horror if I unmask."

"Oh, that is impossible. Your form—your features——"

"Have you seen them all?"

"Indeed, I may say yes. The nose is the only——" Here she interrupted me with a burst of laughter. "You laugh? Perhaps it is—Roman?"

"Or Carthaginian!—how do I know? All I can say with surety is, be not so eager to settle the doubt by endeavoring to see it."

"No, it is impossible that a hideous nose should mar the harmony of so many graces and charms. At any rate, I accept all the consequences of the favor I ask. With that mouth, those eyes, and the other incomparable features, I will permit your nose to be long or short, flat or snub."

"You are a rash fellow."[4]

"There, uncover,—let me see the sun rise at two o'clock in the morning."

"Why, how impetuous you are!"[4]

"Will you oblige me to beg it on my knees? Will you expose me to the ridicule of the whole ball-room?"

"Enough. You wish it; then you shall see me without a mask. Oh, that we women should be so yielding! At least it shall not be my hands that will open Pandora's box. Receive from your own the punishment of your foolish impatience."

"And that happiness, too! Envy me, O mortals! Give me the lyre, O muses! At this moment I am a Pindar—a——"

"At this moment you are a madman!"

"What nervous excitement,—what transport! I cannot untie the knot,—I will cut it. Ah! at last! beauti——" I could not finish the word, such was my surprise—astonishment—terror. *What a nose!* WHAT A NOSE!! WHAT A NOSE!!! I could not have believed that nature was capable of carrying exaggeration—amplification—monstrosity—to such an extreme. The sonnet of Quevedo—

"There was man pasted to a nose"—

would be poor and inadequate to describe it. It was not a human nose,

[4] For both these phrases the serrana uses a single word: *¡Imprudente!* for the first, and *¡Temerario!* for the second. The English will not admit of equal terseness and exactness to express the idea.

but a beet-root, a Persian scimitar, an Egyptian pyramid. Great heavens! and they talk of our country being regenerated! How, then, can such gross abuses exist? If it be just to condemn whatever impedes the slow but sure progress of our institutions,—everything improper, everything exaggerated,—how comes it that a law has not been enacted against outrageously large noses? In the midst of the horror which the unfortunate change of scene caused, I was anxious, without being positively rude, to quit my nasal anomaly. I made incredible efforts to utter a few complimentary phrases. Impossible. If, at that moment, I had had a mirror before me, I am sure I should have seen the face of an idiot. But, happily for my ease of mind, the serrana, who, no doubt, had learned to resign herself to the deformity and all its unfortunate effects, laughed heartily,—but whether at my agony or her own, I could not say. This emboldened me to excuse myself on pretence of speaking to a friend, and, without daring again to look at her, I took my leave with a rather dry and peevish "*Good-evening.*"[5]

Shame lent wings to my feet,—anger blinded me. I scarcely found room to escape. I stumbled over funiture, jostled against persons, even tripped up myself. I should have hastened home, forgetful of either cape or coach, if a gnawing hunger, as enormous as—as the nose in whose shadow my happiness lay buried, had not made itself felt, and added poignancy to my affliction. I rushed to the restaurant, got possession of a table, seized a bill of fare, and ordered whatever could be most quickly brought me.

I ate—not with enjoyment, but with rage—the contents of four different dishes, and was about to begin the fifth, when lo! justice of heaven! what do I behold enter and deliberately take a seat at my very table—in front of me? The serrana herself,—no, the Monstrous Nose!

My first impulse was to start up and run, but the droll little mask petrified me by saying, with the most imperturbable composure and sweetness,—

"What! are you not going to invite me to sup with you?"

I became foolishly confused, and the Nose laughed; unfortunately, the young gallant that accompanied her didn't laugh, else I should have vented my passion and relieved my embarrassment by throttling him.

"*Señora*——" But she interrupted me with,—

"I will not cause you much expense: a glass of Roman punch,—nothing more."

Such boldness nettled me. I resolved to revenge myself by ridiculing her.

"I shall take extreme pleasure in gratifying you, señorita, but I fear the nose will usurp the functions of the mouth. If that enormity cannot be dispensed with, I do not see how——"

[5] In the original, *A los pies de usted!*

"Sure enough. I ought not drink with it on. I shall remove it."

"*How! What do you say? Then——*"

With this she put up her hand and tore off the nose! Miserable, wretched fool, I! It was false,—of pasteboard! and there remained visible her own, no less perfect and handsome than the other features of her face.

How to paint my shame and desperation at the sight of such a ravishing creature! and to think of the levity, indiscretion, and iniquity of my conduct! I was going to beg a thousand pardons,—to weep for my errors,—to kiss the dust of her feet, but she cruelly gave her arm to her companion, disconcerted me with a severe look, and left me with a freezing "GOOD-NIGHT."[6]

WASHINGTON, D. C., August 30, 1879.

[6] In the original, *Beso a usted la mano*,—literally, I kiss your hand.

THE SIGN-LANGUAGE OF THE NORTH AMERICAN INDIANS.

WHILE the study of the sign-language of the North American Indians is, for reasons to be suggested, of special utility, it claims general interest from its illustration of the ancient intercommunication of mankind by gesture. Many arguments have been adduced to prove that the latter preceded articulate speech. The corporeal movements of the lower animals to express, at least, emotion, have been correlated with those of man, and classified by Darwin as explicable on the principles of serviceable associated habits, of antithesis, and of the constitution of the nervous system. A child employs intelligent gestures long in advance of speech, although very early and persistent attempts are made to give it instruction in the latter but not in the former, and it, long after familiarity with speech, consults the gestures and facial expressions of its parents and nurses as if to translate or explain their words, which facts are important in reference to the biologic law that the order of development of the individual is the same as that of the species. Persons of limited vocabulary, whether foreigners to the tongue employed, or native but not accomplished in its use, even in the midst of a civilization where gestures are deprecated, when at fault for words resort instinctively to physical motions that are not wild or meaningless, but picturesque and significant, though perhaps made by the gesturer for the first time; and the same is true of the most fluent talkers on occasions when the exact vocal formula desired does not at once suggest itself or is not satisfactory without assistance from the physical machinery not embraced in the oral apparatus. The signs used by uninstructed congenital deaf-mutes and the facial expression and gestures of the congenitally blind also present considerations under the heads of heredity and atavism. In conjecturing the first attempt of man or his hypothetical ancestor, at the expression either of percepts or concepts, it is difficult to connect vocal sounds with any large number of objects, but readily conceivable that there should have been resort, next to actual touch, to suggest the characteristics of their forms and movements to the eye, fully exercised before the tongue, so soon as the arms and fingers became free for the requisite simulation or portrayal. Linguistic scholars have recently decided that the search for imitative,

onomatopoetic, and directly expressive sounds to explain the origin of human speech has been too exclusive, and that many holophrastic roots of language have been founded in the involuntary sounds accompanying certain actions; but as the action was the essential and the consequent or concomitant sound the accident, it would be expected that a representation or feigned reproduction of the action would have been used to express the idea before the sound associated with that action could have been separated from it. There is also strong probability that in the pristine days when the sounds of the only words yet formed had close connection with objects and the ideas directly derived from them, signs were as much more copious for communication than speech, as the sight embraces more, and more distinct, characteristics of objects than does the sense of hearing.

For the present purpose there is, however, no need to determine upon the priority between communication of ideas by bodily motion and by vocal articulation, if it be but admitted that the connection between them was so early and intimate that the gestures in the wide sense indicated had a direct formative effect upon many words, that they exhibit the earliest condition of the human mind, are traced from the farthest antiquity among all peoples possessing records, are universally prevalent in the savage stage of social evolution, and still adhere to the ordinary speech of civilized men by motions of the face, hands, head, and body, often involuntary, often purposely in illustration or emphasis.

The power of the visible gesture relative to and its influence upon the words of modern oral speech are perhaps, though with the qualification hereafter indicated, in inverse proportion to the general culture, but do not bear that or any constant proportion to the development of the several languages with which gesture is still more or less associated. They are affected more by the sociological conditions of the speakers than by the degree of excellence of their tongue. The statement is frequently made that gesture is yet to some highly advanced languages a necessary modifying factor, and that only when a language has become so artificial as to be completely expressible in written signs—indeed, has been remodeled through their long familiar use—can the bodily signs be wholly dispensed with. The story has been told by travelers in many parts of the world that various languages cannot be clearly understood in the dark by their possessors, using their mother-tongue between themselves. The evidence for this anywhere is suspicious, and when it is, as it often has been, asserted about some of the tribes of North American Indians, it is absolutely false, and must be attributed to the error of travelers, who, ignorant of the dialect, never see the natives except when trying to make themselves intelligible to their visitors by a practice which they have found by experience to have been successful with strangers to their tongue,

or perhaps when they are guarding against being overheard by others. In fact, individuals of those American tribes specially instanced in these reports as unable to converse without gesture, often, in their domestic *abandon*, wrap themselves up in robes or blankets, with only breathing-holes before the nose, so that no part of the body is seen, and chatter away for hours, telling long stories. If in daylight they thus voluntarily deprive themselves of the possibility of making signs, it is clear that their preference for talks around the fire at night is explicable by very natural reasons without the one attributed. The inference, once carelessly made from the free use of gesture by some of the Numa stock, that their tongue was too meagre for use without signs, is refuted by the now ascertained fact that their vocabulary is remarkably copious, and their parts of speech better differentiated than those of many peoples on whom no such stigma has been affixed.

The true distinction is, that where people speaking precisely the same dialect are not numerous, and are thrown into constant contact on equal terms with others of differing dialects and languages, gesture is necessarily resorted to for converse with the latter, and remains as a habit or accomplishment among themselves; while large bodies enjoying a common speech, and either isolated from foreigners, or, when in contact with them, so dominant as to compel the learning and adoption of their own tongue, become impassive in its delivery. The undemonstrative English, long insular, and now rulers when spread over continents, may be compared with the wildly-gesticulating Italians dwelling in a maze of dialects, and subject for centuries either to foreign rule or to the influx of strangers on whom they depended. The difference in what is vaguely styled temperament does not wholly explain this contrast. As the number of dialects in any district decreases, so will the gestures, though doubtless there is also influence from the fact, not merely that a language has been reduced to and modified by writing, but that people who are accustomed generally to read and write, as are the English and Germans, will after a time think and talk as they write, and without the accompaniments still persistent among Hindus, Arabs, and the less literate Europeans.

A Cisatlantic instance is shown of the discontinuance of gesture-speech with no development in the native language of the gesturers, but from the invention for intercommunication of one used in common. The Kalapuyas of Southern Oregon until recently used a sign-language, but have gradually adopted for foreign intercourse the composite tongue, commonly called the Tsinuk or Chinook jargon, that arose for trade purposes on the Columbia River before the advent of Europeans, founded on the Tsinuk, Tsihali, Nutka, etc., but now enriched by English and French terms, and have nearly forgotten their old signs. The prevalence of this mongrel speech, originating in the same causes that produced the pigeon-English or *lingua-franca* of the Orient, ex-

plains the marked scantness of sign-language among the tribes of the Northwest coast.

When the specific practice of the sign-language has been discontinued, either from the adoption of a jargon, or from the common use of the conquering English, French, or Spanish, some of the gestures formerly employed as substitutes for words may survive as a customary accompaniment to oratory or impassioned conversation, and, when ascertained, should be carefully noted. An example, among many, may be found in the fact that the now civilized Muskoki, or Creeks, when speaking of the height of children and women, illustrate their words by holding the hand at the proper elevation, palm up; but when describing the height of animals or inanimate objects they hold the palm downward. This, when correlated with the distinctive signs of other Indians, appears to be an interesting case of the survival of a practice which the oldest men of the tribe only remember vaguely by tradition.

The assertion has been made by many writers, and is currently repeated by Indian traders and some army officers, that all the tribes of North America have had and still use a *common* and *identical* sign-language of ancient origin, in which they can communicate freely without oral assistance. The fact that this remarkable statement is at variance with some of the principles of the formation and use of signs set forth by Dr. Tylor,—whose inimitable chapters on gesture-speech in his "Researches into the Early History of Mankind" have in a great degree prompted the present inquiries,—does not appear to have attracted the attention of that eminent authority. He receives the report without question, and formulates it that "the same signs serve as a medium of converse from Hudson's Bay to the Gulf of Mexico." Its truth can only be established by careful comparison of lists or vocabularies of signs taken at widely different times and places. For this purpose lists have been collated by the writer, taken in different parts of the country, at several dates from the last century to the last month, comprising together more than eight hundred signs, many of them, however, being mere variants or synonyms for the same object or quality.

The result of the collation and analysis thus far made is, that the alleged existence of *one* universal and absolute sign-language is, in its terms of general assertion, one of the many popular errors prevailing about our aborigines. In many instances there is an entire discrepancy between the signs made by different bodies of Indians to express the same idea; and if any of these are regarded as determinate, or even widely conventional, and used without further devices, they will fail in conveying the desired impression to any one unskilled in gesture as an art, who had not formed the same precise conception, or been instructed in the arbitrary motion. Probably none of the gestures that are found in current use are in their origin conventional, but are only portions,

more or less elaborate, of obvious natural pantomime, and those proving efficient to convey most successfully at any time the several ideas became the most widely adopted. Sometimes signs, doubtless once air-pictures of the most striking outline of an object, or of the most characteristic features of an action, have in time become abbreviated, and to some extent conventionalized, among members of the same tribe and its immediate neighbors, and have not become common to them with other tribes simply because the form of abbreviation has been peculiar. In other cases, with the same conception and attempted characterization, another, yet equally appropriate, delineation has been selected, and when both of the differing delineations have been abbreviated the diversity is vastly increased. The original conception, being independent, has necessarily also varied, because all objects have several characteristics, and what struck one set of people as the most distinctive of these would not always so impress another. From these reasons we cannot expect, without trouble, to understand the etymology of all the signs, being less rich in ancillary material than were even the old philologists, who guessed at Latin and Greek derivations before they were assisted by Sanscrit and other Aryan roots.

It must be noted that in the study and analysis of all written descriptions of Indian signs there is danger lest the civilized understanding of the original conception may be mistaken or forced. The liability to error is increased from the fact that some of the collections are not taken directly from the Indians themselves, but are given as obtained at second-hand from white traders, trappers, and interpreters, who, through misconception in the beginning and their own introduction or modification of gestures, have produced a jargon in the sign as well as in the oral intercourse. If an Indian finds that his interlocutor insists upon understanding and using a certain sign in a particular manner, it is within the very nature, tentative and elastic, of the gesture-art—both performers being on an equality—that he should adopt the one that seems to be intelligible or that is pressed upon him, as with much greater difficulty he has learned and adopted many foreign terms used with whites before attempting to acquire their language, but never with his own race. Thus there is now, and perhaps always has been, what may be called a *lingua-franca* in the sign vocabulary.

The *attempt to convey meaning by signs is*, however, *universal* among the Indians of the plains and those still comparatively unchanged by civilization, as is its successful execution in a cultivated art, which consists in actually pointing out objects in sight, not only for designation, but for application and predication, and in suggesting others to the mind by action and the airy forms produced by action. It is very noticeable that the Indian signs are characterized by motion rather than by position, and that the motions are large and free, seldom minute.

In no other part of the world has there been spread over so vast a

space so small a number of individuals divided by so many linguistic and dialectic boundaries. Many wholly distinct tongues have for a long indefinite time been confined to a few scores of speakers, verbally incomprehensible to all others on the face of the earth who did not, from some rarely operating motive, laboriously acquire their language. Even when the American race, so styled, flourished in the greatest population of which we have any evidence, the immense number of languages and dialects still preserved, or known by early recorded fragments to have once existed, so subdivided it that but the dwellers in a very few villages could talk together with ease, and all were interdistributed among unresponsive vernaculars, each to the other being bar-bar-ous in every meaning of the term. It is, however, noticeable that the three great families of Iroquois, Algonkin, and Muskoki, when met by their first visitors, do not appear to have often impressed the latter with their reliance upon a gesture code to the same extent as has always been reported of those now and formerly found farther inland. Among these families there were more people dwelling near together in sociological communities, of the same speech, though with dialectic peculiarities, than became known later in the later West, and, not being nomadic, their intercourse with strange tribes was less individual and conversational.

The use of gesture-signs, continued, if not originating, in necessity for communication with the outer world, became entribally convenient from the habits of hunters, the main occupation of all savages, depending largely upon stealthy approach to game, and from the sole form of their military tactics, to surprise an enemy. In the still expanse of virgin forests, and especially in the boundless solitudes of the great plains, a slight sound can be heard over a vast area, that of the human voice being from its rarity the most startling, so that it is now, as it probably has been for centuries, a common precaution for members of a hunting or war party not to speak together when on such expeditions, communicating exclusively by signs. The acquired habit exhibits itself not only in formal oratory, but in impassioned conversation.

This domestic as well as foreign exercise for generations in the gesture-language has naturally produced great skill both in expression and reception, so as to be measurably independent of any prior mutual understanding, or what in a system of signals is called preconcert. Two accomplished army signalists can, after sufficient trial, communicate without either of them learning the code practiced by the other, one being mutually devised for the occasion, and those specially designed for secrecy are often deciphered. So, if any one of the more approximately conventional signs is not quickly comprehended, an Indian skilled in the principle of signs resorts to another expression of his flexible art, perhaps reproducing the gesture unabbreviated and made more graphic, perhaps presenting either the same or another conception

or quality of the same object or idea by an original portraiture. A lesson was learned by the writer as to the abbreviation of signs, and the possibility of discovering the original meaning of those most obscure, from the attempt of a Cheyenne to convey the idea of *old man*. He held his right hand forward, bent at elbow, fingers and thumb closed sidewise. This not conveying any sense, he found a long stick, bent his back, and supported his frame in a tottering step by the stick held, as was before only imagined. There at once was age dependent on a staff. It is probable that none of the Indian signs are arbitrary, but that in them, as in all his actions, man had at first a definite meaning or purpose, together with method in their after-changes or modifications. The formation and reception of signs upon a generally understood principle, by which they may be comprehended when seen for the first time, is doubtless one explanation of the report of a common code, as out of a variety of gestures appropriate to express a particular idea, an observer may readily have met the same one in several localities. The same tribe has, indeed, in some instances, as appears by the collected lists, a choice already furnished by tradition or importation, or both together, of several signs for the same thought-object. Thus there are produced synonyms as well as dialects in the sign-language.

The general result is that two intelligent mimes seldom fail of mutual understanding, their attention being exclusively directed to express thoughts by the means of comprehension and reply equally possessed by both without the mental confusion of conventional sounds only intelligible to one. The Indians who have been shown over the civilized East have, also, many times succeeded in holding intercourse, by means of their invention and application of principles in what may be called the voiceless mother-utterance, with white deaf-mutes, who surely have no semiotic code more nearly connected with that attributed to the plain-roamers than is derived from their common humanity. On one of the most interesting of these occasions, at the Pennsylvania Institution for the Deaf and Dumb in 1873, it was remarked that the signs of the deaf-mutes were much more readily understood by the Indians than were theirs by the deaf-mutes, and that the latter greatly excelled in pantomimic effect. This need not be surprising when it is considered that what is to the Indian a mere adjunct or accomplishment is to the deaf-mute the natural mode of utterance, and that there is still greater freedom from the trammel of translating words into action—instead of acting the ideas themselves—when, the sound of words being unknown, they remain still as they originated, but another kind of sign, even after the art of reading is acquired, and do not become entities as with us.

Some examples have been selected of diverse conceptions and executions for the same object or thought.

Chief. Four distinct signs.

1. Forefinger of right hand extended, passed perpendicularly downward, then turned upward in a right line as high as the head. "Rising above others."

2. With forefinger of right hand, of which the other fingers are closed, pointing up, back to forehead, describe the flight of an arrow shot up and turning down again, allowing the hand to drop, the finger pointing down until about the middle of the body. Same idea of superior height expressed conversely. Almost the same sign, the hand, however, being moved downward rapidly and the gesture preceded by touching the lower lip with the index, the French deaf-mutes use for "command," "order."

3. Begin with sign for man; then the forefinger of right hand points forward and downward, followed by a curved motion forward, outward, and downward. "He who sits still and commands others."

4. Raise the index of right hand, which is held upright; turn the index in a circle and lower it a little to the earth. "He who is in the centre of surrounding inferiors." The air-picture reminds of the royal sceptre with its sphere.

Day. Five signs.

1. Pass the index-finger pointing along the vault of heaven from east to west. Our deaf-mutes use the same sign.

2. Same motion with whole right hand.

3. Same motion with forefinger of right hand crooked, followed by both hands slightly spread out and elevated to a point in front of and considerably above the head, then brought down in a semicircle to a level below the shoulder, ending with outspread palms upward. This, probably, is the opening out of the day from above, after the risen sun.

4. Simply make a circle with the forefingers of both hands. The round disk.

5. Both hands flat, backs before breast and separated. The French deaf-mutes fold the hands upon each other and the breast, then raise them, palms inward, to beyond each side of the head.

To-day, this day, has two widely discrepant signs in, at least, appearance. In one, the nose is touched with the index tip, followed by a motion of the fist towards the ground,—perhaps including the idea of now, here. In the other, both hands are extended, palms outward, and swept slowly forward and to each side. This may combine the idea of *now* with *openness*, the first part of it resembling the general deaf-mute sign for "here" or "now."

Death, dead. Five signs.

1. Right hand, fingers front at height of stomach, then, with a sort of flop, throw the hand over with the palm up, finger pointing a little to the right and front, hand held horizontal. "Upset, keeled over."

2. Left hand flattened and held, back upward, thumb inward, in front of and a few inches from the breast, right hand slightly clasped, forefinger more extended than the others, and passed suddenly under the left hand, the latter being at the same time gently moved towards the breast. "Gone under."

3. Hold the left hand flat against the face, back outward; then pass the right hand, held in the same manner, under the left, striking and touching it lightly. The same idea of under or burial, quite differently executed.

4. Throw the forefinger from the perpendicular into a horizontal position towards the earth with the back downward.

5. Place the palm of the hand at a short distance from the side of the head, then withdraw it gently in an oblique downward direction, and incline the head and upper part of the body in the same direction. It is worthy of note that there is an apparent connection between this conception and execution and the etymology of the corresponding terms in the Ojibwa dialect, from which tribe this sign is received; "he dies," is *nebo;* "he sleeps," is *niba.* The common idea is expressed by the gesture: a sinking to rest. The original signification of the root *nib* seems to be "leaning"; *anibeia,* it is leaning; *anibekweni,* he inclines the head sidewards. The word *niba* or *nibe* (only in compounds) conveys the idea of "night," perhaps as the falling over, the going to rest, or the death, of the day.

Like the Ojibwa, the French deaf-mute conception is that of gently falling or sinking, the right index falling from the height of the right shoulder upon the left forefinger, towards which the head is inclined.

Kill. In one sign the hands are held with the edges upward, and the right strikes the left transversely, as in the act of chopping. This seems to convey particularly the notion of a stroke with a tomahawk or war-club. Another sign: Smite the sinister palm earthward with the dexter fist sharply. Another: Strike out with the dexter fist towards the ground. A fourth: Pass the right under the left forefinger,—"make go under." The threat, "I will kill you," appears in one case as directing the right hand towards the offender, and springing the finger from the thumb as in the act of sprinkling water, the idea being perhaps causing blood to flow, or perhaps sputtering away the life, though this part of the sign is nearly the same as that sometimes used for the discharge of a gun or arrow.

Fear, coward.

1. Both hands, with fingers turned inwards opposite the lower ribs, then brought upward with a tremulous motion, as if to represent the common idea of the heart rising up to the throat.

2. Head stooped down, and arm thrown up quickly as if to protect it.

3. Fingers and thumb of right hand, which droops downward, closed to a point to represent a heart, violently and repeatedly beaten against the left breast just over the heart, to imitate palpitation.

The French deaf-mutes, besides beating the heart, add a nervous backward shrinking with both hands. Our deaf-mutes omit the beating of the heart, except for excessive terror.

4. Point forward several times with the index, followed by the remaining fingers, each time drawing the index back as if impossible to keep the man to the front.

Woman has four signs: one expressing the mammæ, one indicating shortness as compared with man, and the two most common severally indicating the longer hair or more flowing dress. The deaf-mutes generally mark the line of the bonnet-string down the cheek.

Quantity, many, much. Six wholly distinct executions and several conceptions.

1. The flat of the right hand patting the back of the left several times, proportioned in number to the quantity. Simple repetition.

2. Clutching at the air several times with both hands. Same idea of repetition, more objective.

3. Hands and arms passed curvilinearly outward and downward as if forming a large globe, then hands closed and elevated as if something were grasped in each, and held up as high as the face.

4. Hands held scoop-fashion, palms towards each other, about two feet apart, at the height of the lower ribs, finger-ends downward; then with a diving motion, as if scooping up small articles from a sack or barrel, bring the hands nearly together, fingers closed, as if holding a number of small objects in each hand, and up again to the height of the breast.

5. Both hands closed, brought up in a curved motion towards each other to the level of the neck. Idea of fullness.

6. Move the two open hands towards each other, and slightly upward; the action of forming or delineating a *heap*.

I, myself, first personal pronoun.

Represented in some tribes by motions of the right hand upon the breast, the hand sometimes clinched and struck repeatedly on the breast,—or the fingers, or the index alone, placed upon it. Others touch the nose-tip with the index, or lay it upon the ridge of the nose, the end resting between the eyes.

Some deaf-mutes push the forefinger against the pit of the stomach, others against the breast, and others point it to the neck for this personality.

Yes, affirmative, it is so.

One of the signs is somewhat like "Truth," but the forefinger proceeds straight forward from the breast instead of the mouth, and when at the end of its course it seems gently to strike something, as if the

subject were at an end; no further discussion, "'nuff said," as is the vulgar phrase of agreement.

Others wave both hands straight forward from the face, which may be compared with the forward nod common over most of the world for assent, but the New Zealanders elevate the head and chin, and the Turks shake it like our negative.

With others, again, the right hand is elevated to the level and in front of the shoulder, the two first fingers somewhat extended, thumb resting against the middle finger, and then a sudden motion in a curve forward and downward. As this corresponds nearly with the sign made for "sit" by the same tribes, its conception may be that of resting upon or settling a question.

Good. Five diverse signs.

1. The hand held horizontally, back upward, describes with the arm a horizontal curve outward.

2. Simple horizontal movement of the right hand from the breast. These signs may convey the suggestion of level,—no difficulty,—and are nearly identical with one of those for "content," "glad." The first of them is like our motion of benediction.

3. With the right hand, palm down, fingers to the left, thumb touching the breast, move the hand straight to the front and slightly upward.

4. Wave the right hand from the mouth, extending the thumb from the index and closing the other three fingers.

5. The right hand, fingers pointing to the left, on a level with mouth, thumb inward, suddenly moved with curve outward, so as to present the palm to the person addressed.

These last signs appear to be connected with a pleasant taste in the mouth, as is the sign of the French and our deaf-mutes, waving thence the hand, back upward, with fingers straight and joined, in a forward and downward curve. The same gesture with hand sidewise is theirs and ours for general assent,—"very well!"

Understand, know, is very variously expressed by manipulations in which the nose, ear, chin, and mouth are selected as objective points, all the motions being appropriate. *Think* or *guess* is also diversely indicated. Sometimes the forefinger is simply drawn across the breast from left to right. Again, the right fist is held with the thumb between the eyes and propelled front and downward. We, for show of thought, rest the forefinger on the forehead. There is also a less intelligible sign in which the right hand, fingers and thumb loosely closed, index extended crooked, is dipped over towards and suddenly forward from the right shoulder. All the gestures of deaf-mutes relating to intelligence are connected with the forehead.

Animals are expressed pantomimically by some characteristic of their motion or form, and the Indian mimographers generally seem to

have hit upon the same sign for each animal, but to this rule there are marked exceptions in the *deer* and the *dog*. For the *deer* five signs are noted:

1. Right hand extended upward by the right ear, with a quick puff from the mouth,—perhaps in allusion to the fleet escape on hearing noise.

2. Make several passes with the hand before the face.

3. Forefinger of right hand extended vertically, back towards breast, then turned from side to side to imitate the motion of the animal when walking at leisure.

4. Both hands, fingers irregularly outspread at the sides of the head, to imitate the outspread horns. This sign is made by our deaf-mutes.

5. Same position, confined to the thumb and two first fingers of each hand.

For *dog*, one of the signs gives the two forefingers slightly opened, drawn horizontally across the breast from left to right. This would not be intelligible without knowledge of the fact that before the introduction of the horse, and even yet, the dog has been used to draw the tent-poles in moving camp, and the sign represents the trail. Indians less nomadic, who built more substantial lodges, and to whom the material for poles was less precious than on the plains, would not perhaps have comprehended this sign, and the more general one is the palm lowered as if to stroke gently in a line conforming to the animal's head and neck. It is abbreviated by simply lowering the hand to the usual height of the wolfish aboriginal breed, and suggests *the* animal *par excellence* domesticated by the Indians and made a companion. The French and American deaf-mutes more specifically express the dog by snapping the fingers and then patting the thigh, or by patting the knee and imitating barking with the lips.

Among the signs that are found generally current and nearly identical may be noted that for *horse*, made by the fore and middle finger of the right hand, placed by some astraddle of the left index, and by others of the edge of the left hand, the animal being considered at first as only serviceable for riding and not for draught. The French deaf-mutes add to the straddling of the index the motion of a trot. Our deaf-mutes indicate the ears, followed by straddling the left hand by the fore and middle fingers of the right.

Same, similar, which is made not only among all our tribes, but by those all over the world, and by deaf-mutes, by extending the two forefingers together side by side, backs upward, sometimes moved together slightly forward. When held at rest in this position, *companion* and the tie of fellowship, what in days of chivalry was styled "brothers in arms," can be indicated, and, as a derivative also, *husband*. The French and American deaf-mutes use this sign, preceded by one showing the sex, for brother or sister.

An opposition to this is given, though not generally reported, for *he*, or *another person*, by placing one straight forefinger over the other, nearly touching, and then separated with a moderately rapid motion. The deaf-mutes for "he" point the thumb over the right shoulder.

The principal motion for *admiration, wonder*, consists in placing the right hand before the mouth, which is open, or supposed so to be,—a gesture seemingly involuntary with us.

The general sign for *sun*, when it is given as distinguished from *day*,—made by forming a circle with the thumb and forefinger raised to the east or along the track of the orb,—is often abbreviated by simply crooking the elevated forefinger into an arc of a circle, which would more naturally be interpreted as the crescent moon. It appears that some tribes that retain the full descriptive circle for the sun do form a distinguishing crescent for the moon, but with the thumb and forefinger, and for greater discrimination precede it with the sign for *night*, which, with some occasional additions, is the crossing of both horizontally outspread palms, right above left, in front of the body, the conception being covering, shade, and consequent obscurity. With a slight differentiation, *darkness* is presented, and with another, *forget, forgotten*, that is, darkness in the memory.

While several conceptions and delineations have been mentioned for "good," those most common for *bad* consist mainly in smartly throwing out the dexter fingers as if sprinkling water, or snapping all the fingers from the thumb. This may be compared with the deaf-mute sign of flipping an imaginary object between the thumb-nail and the forefinger, denoting something small or contemptible. The motion of snapping a finger either on or from the thumb in disdain is not only of large modern prevalence in civilization, but is at least as ancient as the contemporary statue of Sardanapalus at Anchiale. Another less forcible but equally suggestive gesture for *bad* is closing the hand and then opening while lowering it, as if dropping out the contents; "not worth keeping." The deaf-mutes preserve the connection of bad and taste by brushing from the side of the mouth.

Inquiry, question,—What? Which? When?

This is generally denoted by the right hand held upward, palm upward, and directed towards the person interrogated, and rotated two or three times edgewise. When this motion is made, as among some tribes, with the thumb near the face, it might be mistaken for the derisive, vulgar gesture called "taking a sight," or, as the French phrase it, "donner un pied de nez," descending to our small boys from antiquity; but the separate motion of the fingers in the latter is more nearly correlated with the Indian sign for *fool*. The same rotation upon the wrist, with the index and middle fingers diverged over the heart, means specifically *uncertainty, indecision*, "more than one heart for a purpose," and a variant of it appears in one of the signs for "*I don't know.*"

The Indian sign for "inquiry" is far superior to that of the French deaf-mutes, which is the part of the French shrug with the hunched shoulders omitted.

Fool, foolish. The prevailing gesture is a finger pointed to the forehead and rotated circularly,—"rattle-brained." The only variance is where the sign for "man" is followed by shaking the fingers held downward, without reference to the head,—the idea of looseness simply. French deaf-mutes shake the hands above the head after touching it with the index.

No, negative. The right hand—though in the beginning of the sign held in various positions—is generally either waved before the face (which is the sign of our deaf-mutes for emphatic negative), as if refusing to accept the idea or statement presented, or pushed sidewise to the right from either the breast or face, as if dismissing it or setting it aside. This may be compared with our shaking of the head in denial; but that gesture is not so universal in the Old World as is popularly supposed, for the ancient Greeks, followed by the modern Turks and rustic Italians, threw the head back, instead of shaking it, for *No.* The Egyptian negative linear hieroglyph is clearly the gesture of both hands, palms down, waved horizontally apart at the level of the elbow.

Lie, falsehood, is almost universally expressed by some figurative variation on the generic theme of a forked or double tongue,—"two different stories," in which the two first fingers of the right hand separate from the mouth. *Truth, true,* is naturally contradistinguished by the use of a single finger, the index, pointing straight from the mouth forward and sometimes upward,—"One tongue; speech straight to the front; no talk behind a man." Sometimes, however, the breast is the initial point, as in the French deaf-mute sign for "sincere." The deaf-mutes also gesture "truth" by moving one finger straight from the lips,—"straight-forward speaking,"—but distinguish "lie" by moving the finger to one side,—"sideways speaking."

Offspring or descendant, child in filial relation,—not simply as young humanity,—is generally denoted by a slightly-varied dumb show of issuance from the loins, the line traced sometimes showing a close diagnosis of parturition. The sign, with additions, means father, mother, grandparent, but its expurgated form among the French deaf-mutes means parentage generically.

Possession, mine, my property. The essential of this common sign is clinching the right hand held at the level of the head and moving it gently forward, clearly the grasping and display of property. None of the deaf-mute signs to express "possession, ownership," resemble this or are as graphic. Our deaf-mutes press an imaginary object to the breast with the right hand.

Steal. The prevalent delineation is by holding the left arm horizontally across the body and seizing from under the left fist an im-

aginary object with the right hand, implying concealment and the transportation that forms part of the legal definition of larceny. This sign is also made by our deaf-mutes. Sometimes the fingers of the right hand are hooked, as if grabbing or tearing. The specialty of horse-theft is indicated by the pantomime of cutting a lariat.

Trade, barter, exchange, is very commonly denoted by a sign, the root of which is the movement of the two flat hands or the two fore-fingers past each other, so that one takes the place before held by the other, the exact conceit of exchange. Our deaf-mutes use the same gesture with the hands closed. An invitation to a general or systematic barter or trade, as distinct from one transaction, is expressed by repeated taps or the use of more fingers. The rough resemblance of this sign to that for "cutting" has occasioned mistakes as to its origin. It is reported by Captain Burton as the conception of one smart trader cutting into the profits of another,—"diamond cut diamond." The trade-sign is, on the plains, often used to express the *white man,*—vocally named Shwop,—a legacy from the traders, who were the first Caucasians met. Generally, however, the gesture for *white man* is by designating the hat, or head-covering of civilization. This the French deaf-mutes apply to all *men,* as distinct from women.

A few signs have been selected that are not remarkable either for general or limited acceptance, but are of interest from special conception or peculiar figuration.

The relation of *brothers, sisters,* and of brother and sister, children of the same mother, is signified by putting the two first finger-tips into the mouth, denoting the nourishment taken from the same breast. One of the signs for *child* or infant is to place the thumb and fingers of the right hand against the lips, then drawing them away and bringing the right hand against the left fore-arm as if holding an infant. The Cistercian monks, vowed to silence, and the Egyptian hieroglyphers, notably in the designation of Horus, their dawn-god, used the finger in or on the lips for child. It has, however, been conjectured in the last instance that the gesture implied, not the mode of taking nourishment, but inability to speak—*in-fans.* An uninstructed deaf-mute, as related by Mr. Denison of the Columbia Institution, invented to express "sister" first the sign for "female," made by the half-closed hands with the ends of fingers touching the breasts, followed by the index in the mouth.

Destroyed, all gone, no more.

The hands held horizontal and the palms rubbed together two or three times circularly; the right hand is then carried off from the other in a short horizontal curve. "Rubbed out." This resembles the Edinburgh and our deaf-mute sign for "forgive" or "clemency," the rubbing out of offense.

Done, finished. The hands placed edges up and down, parallel to each other, right hand outward, which is drawn back as if cutting something. An *end* left after cutting is suggested; perhaps our colloquial "cut short." The French and our deaf-mutes give a cutting motion downward, with the right hand at a right angle to the left.

Glad, pleased, content. Wave the open hand outward from the breast, to express heart at ease,—"bosom's lord sits lightly on its throne." Another gesture, perhaps noting a higher degree of happiness, is to raise the right hand from the breast in serpentine curves to above the head. "Heart beats high."

Dissatisfaction, discontent, is naturally contrasted by holding the index transversely before the heart, and rotating the wrist several times, indicating disturbance of the organ, which our aborigines, like modern Europeans, poetically regard as the seat of the affections and emotions, not selecting the liver or stomach as other peoples have done with greater physiological reason.

To *hide, conceal,* is graphically portrayed by placing the right hand inside the clothing of the left breast, or covering the right hand, fingers hooked, by the left, which is flat, palm downward, and held near the body. The same gestures mean "*secret.*"

Peace, or *friendship,* is sometimes shown by placing the tips of the two first fingers of the right hand against the mouth and elevated upward and outward to mimic the expulsion of smoke,—"we two smoke together." It is also often rendered by the joined right and left hands, the fingers being sometimes interlocked, and sometimes simply by hooking the two forefingers together. Our deaf-mutes interlock the forefingers for "friendship," clasp the hands, right uppermost, for "marriage," and make the last sign, repeated with the left hand uppermost, for "peace." The idea of union or linking is obvious. It is, however, noticeable that while this ceremonial gesture is common and ancient, the practice of shaking hands on meeting, now the annoying etiquette of the Indians in their intercourse with whites, was never used by them between each other, and is clearly a foreign importation. Their fancy for affectionate greeting was in giving a pleasant bodily sensation by rubbing each other's breasts, arms, and stomachs. Our senseless and inconvenient custom of shaking hands is, indeed, by no means general throughout the world, and in the extent to which it prevails in the United States is disgracefully exceptional.

The profession of *peace, coupled with invitation,* is often made from a distance by the acted spreading of a real or imaginary robe or blanket,—"come and sit down."

The sign for *stone* has an archæological significance,—the right fist being struck repeatedly upon the left palm, as would be instinctive when a stone was the only hammer.

Prisoner is a graphic picture. The forefinger and thumb of the

left hand are held in the form of a semicircle opening towards and near the breast, and the right forefinger, representing the prisoner, is placed upright within the curve and passed from one side to another, in order to show that it is not permitted to pass out.

Soft is ingeniously expressed by first striking the open left hand several times with the back of the right, and then striking with the right the back of the left, restoring the supposed yielding substance to its former shape.

Without further multiplying examples, the conclusion is presented that the gesture-signs among our Indians show no uniformity in detail, the variety in expression among them and in their comparison with those of deaf-mutes and transatlantic mimes being in itself of psychological interest. The generalization of Tylor that "gesture-language is substantially the same among savage tribes all over the world" must be understood as referring to their common use of signs and of signs formed on the same principles, but not of the same signs even "substantially," however indefinitely that term may be used. The art is not a mere semaphoric repetition of arbitrary motions, but is founded upon principles that can be readily applied by travelers and officials so as to give them much independence of professional interpreters, a class dangerously deceitful and tricky. Possessing this art, as distinguished from a limited list of memorized motions, they would accomplish for themselves the desire of the Prince of Pontus, who begged of Nero an accomplished pantomimist from the Roman theatre to interpret among his many-tongued subjects. While thus of practical value, our native semiotics may help the archæologist in his study of picture-writing, the sole form of aboriginal records, for it was but one more step to fasten upon bark, skins, or rocks the evanescent air-pictures that still in pigments or carvings preserve their skeleton outline, and in their ideography approached the rudiments of a phonetic alphabet. The reproduction of gesture-lines in these pictures seems to have been most frequent in the attempt to convey those subjective ideas which were beyond the range of an artistic skill limited to the direct representation of objects; so the part of the pictographs which is the most difficult of interpretation is precisely that which the study of the sign-language is likely to elucidate. In this connection it may be mentioned that a most interesting result has been obtained in the tentative comparison, so far made, between the gesture-signs of our Indians and some of the characters in the Chinese, Assyrian, Mexican, and Runic alphabets or syllabaries, and also with Egyptian hieroglyphs.

While the gesture-utterance presents no other part of grammar to the philologist besides syntax, or the grouping and sequence of its ideographic pictures, the arrangement of signs when in connected succession affords an interesting comparison with the early syntax of vocal lan-

guage, and the analysis of their original conceptions, studied together with the holophrastic roots in the speech of the gesturers, may aid to ascertain some relation between concrete ideas and words. This is specially the case where a language has not advanced far beyond the holophrastic or synthetic stage, and it therefore applies markedly to American linguistics. Thomas Aquinas said, "*Nomina debent naturis rerum congruere;*" and, surely, gestures being founded wholly on *nature*, with even yet slight artificial corruption, may explain the origin of another nearly contemporaneous device of expression,—the visual onomatopœia illustrate the audible.

GARRICK MALLERY,
Bvt. Lt.-Col. U.S.A.

WHIFFS FROM AN OLD SAILOR'S PIPE.

WHIFF THE SECOND.

THE MYSTERIOUS VOICE.

"There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy."

In the year 18— I found myself attached as a watch-officer to the "V——," one of the ships belonging to a squadron stationed on the west coast of Africa, cruising there for the suppression of the infamous slave-trade.

This "V——" was a stanch, old-fashioned, deep-waisted sloop-of-war of nearly eight hundred tons burden, carrying twenty guns, with a complement of more than two hundred souls in her ship's company.

She had been built years previously, during the régime of the "Navy Commissioners," but at this time, from the many repairs that had been made upon her hull, there was scarcely a stick of the original timber remaining, although her model had been sacredly preserved

"Through all the changes of the changing years."

There was a report current in naval circles relative to the modeling of this vessel and of her sister-ships,—for we had six of these naval beauties in our service,—that the said Navy Commissioners, when they had assembled together for the purpose of examining plans and deciding upon the model by which these vessels should be constructed, had selected that one from which they were afterwards built, by first reducing their length of keel, as on the original plan, *from one hundred and sixty* to *one hundred and thirty feet*, and this reduction in their length was made by cutting those thirty feet *square off from the after part of the model*. As the "V——" had very full quarters, and anything but a clean run, this current report was in all probability correct.

Notwithstanding this reduction of length the "V——" was a comfortable "old tub," that could run along from six to eight knots under favorable conditions of wind and sea, while with a quartering gale she could go ten.

Our captain was a tall, thin, nervous old gentleman, who had not seen much service afloat, consequently was not a practical seaman. He had grave doubts as to the stability of any ship of war when under canvas, and was particularly fearful that this one which he commanded would either be capsized during some squall, or else wrecked by running upon rocks or shoals. These dangers to navigation, although not laid down upon our charts, nevertheless existed, in his imagination, on every mile of the broad Atlantic.

It was his standing order that the officers of the deck should reduce sail whenever in their opinion it was necessary to do so, reporting the facts afterwards. But no one, not even the first lieutenant, could make sail; the captain, and the captain only, could order sail to be made after it had once been taken off the ship. In consequence of this order the officers were very chary in reducing sail, and did so only when in their opinion it was absolutely necessary.

In the ward-room we had six line officers and four idlers as mess-mates. The former were "old sea-dogs," each one of whom, from long experience, knew how to handle a ship under any and every occurring circumstance, and the latter were jolly fellows, who always kept the first watch when at sea under the starboard side of the topgallant forecastle, there smoking their pipes and spinning their yarns.

After a very warm day, hot even for the African coast, the sun had disappeared behind the horizon, leaving a breeze which seemed to us smokers, who were forward enjoying our pipes, to be deliciously cool; then, as star after star appeared, there was every promise of a lovely night.

Eight bells were struck, and the watch was called, as I went aft to relieve the officer of the deck, who, after passing me the orders, the sail set, and the courses to be steered, started forward for my vacated seat, there to have a whiff from his pipe, and to enjoy the lovely night ere turning in.

I walked around the deck, examined the weather-head braces, the trim of the yards, and the set of the sails. After satisfying myself on each of these points I looked at the compass, and went upon the poop to scan the horizon as to the present and future prospects of the weather. Everthing appearing to be fair, I settled myself into a steady walk, which was to continue, as I supposed, during the four hours I was to be the guardian of the ship and her crew. The weather at this time was delightful, the stars were shining with remarkable brilliancy; indeed, they were so very brilliant that each particular star appeared to be *the star* that outshone all the others, and to be *the one* that singly and alone gave all the light illuminating the heavens.

Not a cloud could be seen in any direction; there was nought to mar the brightness of the sky above, and the waters beneath were scarcely ruffled by the gentle breeze that silently moved our ship over

their surface. Under royals and flying-jib, with the wind abeam, our ship sailed over this "summer sea" almost as noiselessly and gracefully as an albatross skimming the ocean's crest.

It was the custom on board, owing to the excessive heat during the daytime, to grant the ship's company the privilege of singing and smoking until nine o'clock, which is an hour later than the time usually allowed on board ships of war when at sea.

This hour having arrived, orders were given to pipe down, and for the watch to lie aft on the quarter-deck, and stow themselves on the weather side, between the guns; the log was hove and the lights reported out; five knots was the speed of the ship. Everything then became quiet about the decks; and there was at this time no appearance, in any quarter, of any change either in wind or weather. The night was so very beautiful, and the stars so very bright, that I could not refrain from repeating to myself,—

"If yon bright stars which gem the night
Be each a blissful dwelling-place,
Where kindred spirits reunite
And live to meet the loved of this—"

Thus far only had I spoken, when a voice whispered gently in my ear,—

"*You had better shorten sail.*"

The words were spoken very distinctly, and I turned around expecting to see the speaker; but I was alone at the break of the poop, and there was no one near me.

As I was certain that I had heard the words, it was some time before I could satisfy myself that I might have been mistaken, for if I was not, *from whence could the voice have proceeded?*

Resuming my walk and cogitating over the matter, the time passed quickly, and four bells were reported and struck, then I gave the usual orders to—

Relieve the look-outs! Heave the log!

Muster the watch! Report the ten o'clock lights out!

The log again gave five knots as the speed, and there was still no change of wind or of weather. After this I took a stroll around the deck, felt of the weather-head braces, and looked at the yards; finding everything "taut and trim," I went upon the poop, and stood at the starboard quarter scanning the horizon, *and while in this position looking to windward,* the same gentle voice again whispered in my ear,—

"*You had better shorten sail.*"

This time there was no mistake, and I looked around, as I had upon the previous occasion, expecting to see the speaker, but there was no one in sight who could possibly have spoken; indeed, the only person on the poop besides myself was the look-out, stationed at the "life-buoy"

on the port quarter, and he was standing *facing to leeward*, watching the phosphorescence of the sea, utterly oblivious of everything save of his own thoughts.

He certainly was not the mysterious speaker. Who was? I am not easily startled, nor am I superstitious, but is it to be wondered at that I felt, to say the least, queerly, knowing mysterious beings were around who could make themselves heard, yet could neither be seen nor felt? Then I argued to myself, this whisperer is evidently friendly, as accidents do not result from being under short sail, while many terrible ones have resulted from carrying too much; reasoning thus, although the stars were still as brilliantly shining, the wind as gently blowing, and the ship as quietly sailing as when my watch had commenced, and although there was not a cloud to be seen, I gave orders,—

"Furl the royals and stow the flying-jib;" then ordered the watch to remain on their feet, not to lie down any more, but to see and keep everything clear for shortening sail; after this I went forward on the topgallant forecastle, looking at the horizon from all points of view there; but nothing could be seen indicating a change.

As I passed down the forecastle-ladder on my way aft each one of the idlers seated forward greeted me with,—

"Halloo, Bowline, what's the matter?"

"Why are you taking in sail?"

"Are there any squalls brewing?"

As I could give these questioners no good reasons for my action, I preserved a dignified silence and continued on my way, resuming my walk upon the poop, where, in less than five minutes' time and while I was in the act of walking the deck, that same mysterious voice whispered once more,—

"*You had better shorten sail.*"

This was the third time of the warning, and as at the previous time, so now, there was no one in sight or near who could have spoken. *I was alone!*

Hesitating no longer, I made every preparation for stripping the ship of her canvas, but before giving the final orders to do so, examined again the horizon to windward, and there in the far distance perceived a misty appearance, as of an Indian summer haze, and I also thought I could hear a sound like unto that made by wind as it soughs through a forest in winter-time.

Ordering the quartermaster to make a judicious luff and lift the weather-leaches of the topgallant-sails, I took them in, and was about ordering them furled, when there came a sound, a rushing sound, increasing instantly to a roaring like unto that made by Niagara's mighty fall, and with time only to order—

Hard up the helm! Let go the main-sheet!

Let go the lee topsail-sheets! Let go the topsail-halliards!

When a furious blast struck the ship, forcing her over under its mighty power, until the muzzles of our lee guns were buried in the water, while at the same time a dense mass of spray or mist was driven over the rail with a force that blinded every one. As the ship herself was almost thrown on her beam-ends by the first puff of the squall, so all on deck were thrown down, and found themselves struggling in the lee-scuppers. For a few moments, what with the howling of the wind, the slapping of canvas, and the impossibility of standing upright, it appeared to me doubtful whether or no I should be able to save either the sails or the spars; but our stanch old ship paid off slowly and surely, and as the force of the wind was brought abaft the beam the crew picked themselves up and worked with a will in carrying out my orders.

At length discipline, combined with the preparations that I had made, enabled me to triumph over the fury of the squall, and by the time the ship was before the wind, the topsails had been clewed up, and the main-sail hauled snugly up to the yard; then close-reefing the topsails, I set the fore and main, and furled the mizzen, then sent the topgallant and royal yards on deck. Looking around to see what damage had been done, I found the fore-sail and jib were split, and the fore-topgallant-sail blown away from the jack-stay; there were also a few bruised limbs among those who had been pitched to leeward. All the smokers forward lost their pipes and tobacco, and received a thorough drenching, while the watch-officers who had "*turned in*," being on the weather side of the ship, were all "*turned out*" in a most unceremonious manner, finding themselves suddenly sprawling on the deck in their state-rooms.

Everything was "to rights" at last, the ship running before the wind, when, as suddenly as the squall had begun, so as suddenly it ceased, passing away in a cloud of mist, and disappearing in the distance to leeward, leaving nothing to mark its pathway save our good ship stripped of her canvas, and lying almost motionless on the water. I went to the cabin to report, and found the captain standing at the door, looking very pale and very miserable. After giving him the details of the squall and of my actions in regard to the ship, he remarked,—

"That was a terrific squall, Mr. Bowline."

"Yes, sir," I answered, "it was quite heavy. I think it must have been a '*white squall;*' but it is all over now: it has passed ahead; and as the weather is as it was previous to its advent, with every indication of continuing fair, shall I make sail?"

"*Make sail, sir!!*" he answered, with indignation expressed in his tones,—"*make sail, sir!!! No, sir!!!*" Thus the interview ended, and sail was not made on the ship in a hurry.

White squalls, so called, are of very rare occurrence. No seafaring person of my acquaintance has ever experienced one. Even with my

fifty years of service, this was the first and last I have ever met. Showing, as they do, few or no signs of their approach, and traveling with great velocity, they are particularly dangerous, and woe betide that unfortunate vessel overtaken by one, if unprepared to meet it, for she must either be dismasted at the first fury of the blast, or else forced over by its mighty power, be capsized, and

"In the deep bosom of the ocean buried."

From the time when I discovered the far-distant mist that heralded the approach of this one, until the time when it had passed away, not an hour elapsed, and it left us with the stars as brightly shining, the wind as gently blowing, and the sea almost as smooth as it had been before its coming.

As I have stated, sail was not made again on the "V——" in a *hurry*, for, during the space of four days and nights, she remained under the short sail that I had reduced her to, the captain not permitting any more to be made, being fearful lest another white squall might be "bottled up" somewhere in the universe, only to be let loose upon his devoted head.

At last, to the surprise of every one, sail was ordered to be made, and in due time we arrived safely at Porto Praya, where, finding the commander-in-chief, our captain reported

"The dangers he had passed."

In conclusion, I ask, whence came that mysterious voice, but for whose repeated warnings I should not in all probability have discovered the approach of that squall in time to prevent at least serious damage to the ship, or perhaps her loss altogether?

I ascribe the voice and those warning words to that

"Sweet little cherub
That sits up aloft,
And looks out for the life of
Poor Jack."

E. Z. BOWLINE.

CAMPAIGN OF SELMA.

THE cavalry corps of the Military Division of the Mississippi owed its creation to the single effort of one man, and but for his native energy and brilliant talents the Western cavalry would hardly have a place in history.

This is saying much, but a brief account of the condition of the cavalry of the Military Division of the Mississippi in October, 1864, will, I think, justify this conclusion.

At this time the returns in the office of the chief of cavalry showed a nominal force of nearly fifty thousand men, of which only fourteen thousand were actually fit for duty in the field, and these troops were spread far and wide through the States of Kentucky, Missouri, Tennessee, Alabama, and Georgia. This immense force was rendered almost useless by the scattering policy exercised so persistently by our general officers during the war, who undervalued a mounted force, because they did not know how to use it to advantage.

With a cavalry corps of twenty or twenty-five thousand men, properly commanded, and under the immediate orders of the commanding general, the enemy's communications would never be safe, and such a force could offer or accept battle at two or three days' march from the main army with little fear of defeat. Unfortunately, our Western cavalry seldom went into action with sufficient strength to secure great results, no matter how well they fought. General J. H. Wilson, a graduate of 1860, was thoroughly impressed with the necessity of concentration, and used all his powers of argument and persuasion to bring about a result which fulfilled his earnest predictions.

General Sherman did not regard his cavalry with a favorable eye at this time, probably on account of its repeated failures to achieve any great results.

Worn out, if not convinced by Wilson's arguments, he finally said, "Well, I have never been able to do anything with my cavalry, and if you can make anything out of it, I will not divide the honor with you."

On the 24th of October, 1864, General Wilson assumed command of the cavalry of the Military Division of the Mississippi, at Galesville, Alabama, and on the 9th of November the corps was organized into seven divisions, commanded respectively by Brigadier-Generals McCook, Long, Kilpatrick, Grierson, Hatch, Johnson, and Knipe.

These divisions were organized out of commands spread all over the Military Division of the Mississippi, which were after much labor and delay brought together. The mounted men of General Sherman's army consisted at this time of not over seven thousand men, of which about five thousand were divided into three divisions attached to the Army of the Cumberland, commanded respectively by Generals McCook, Garrard, and Kilpatrick. The rest of the mounted troops were assigned to the different army commanders, and were principally useful as orderlies, strikers, and foragers. Occasionally, I suppose, an army commander would offer up a small battalion as a sacrifice to the enemy's cavalry, which at this time had greatly the preponderance. Forrest and Wheeler were estimated to have over twenty thousand men between Galesville and Decatur, Alabama, while Armstrong, Gholson, Ferguson, Jackson, and Roddy were on the south bank of the Coosa, threatening the railroad between Allatoona and the Chattahoochee. General Sherman having determined to march to the sea, the third division was strengthened by taking all the cavalry from the army commanders, dismounting the other divisions, bringing up the men from the rear who were guarding railroads, and Kilpatrick was ready for the field with six thousand troopers.

Kilpatrick's division seems to have restored General Sherman's confidence in his cavalry, as I have lately seen letters from the commanding general to Kilpatrick, written after the march to the sea, in which the cavalry was highly spoken of as having performed excellent service.

The dismounted divisions were sent back to Nashville to be mounted to be ready to take the field against Hood, and by the 14th of November Wilson had organized a force of eight thousand mounted and two thousand dismounted men, who did much—more than any infantry commander has ever been willing to acknowledge—to defeat Hood on the memorable day of Nashville. But we will not complain.

In October, 1864, the cavalry division of the Army of the Ohio was represented in the field near Atlanta by a portion of a brigade under Garrard, while Capron's brigade was at Louisville for remount.

The cavalry of the Army of the Tennessee, under General B. H. Grierson, consisted of two divisions, commanded respectively by Brigadier-General Ed. Hatch, in West Tennessee, and Colonel E. T. Winslow, Fourth Iowa Cavalry, in Missouri and Tennessee, near Memphis. Besides the mounted troops already mentioned, there were five or six regiments of good cavalry and one division of mounted infantry in Kentucky and East Tennessee.

Thus we find nearly one hundred regiments in an almost equal number of sections of country paralyzed by being scattered in insignificant bodies.

Out of this mass Wilson finally organized a force of about thirty

thousand troopers by the 1st of March, 1865, four months from the time of his resuming command of the corps.

The Confederate army under General Hood having been driven across the Tennessee, General Wilson was directed to assemble the cavalry corps in the vicinity of Huntsville, Alabama, but owing to the fact that the railroad did not afford sufficient facilities to supply the troops, and the country about that place having been impoverished by our own and the enemy's forces, General Wilson applied for and obtained permission to establish himself at Gravelly Springs, fifteen miles below Florence, on the Tennessee River.

Wilson was ordered to put his troops in condition to take the field at the earliest practicable moment, as a winter campaign had been decided upon. A portion of the corps was concentrated near Gravelly Springs in the latter part of January, 1865, and during the months of March and February the First, Second, Third, Fourth, Fifth, and Seventh Divisions arrived, and were placed in camps. Every effort was made to raise the corps to the highest possible state of efficiency, with the limited time and resources at hand. The troops and animals had been pushed to the utmost extent of their powers of endurance, during the pursuit of Hood from Nashville. The weather had been extremely cold, wet, and rainy, snow fell frequently during the pursuit, the roads were in a frightful condition, while the country south of Pulaski was utterly barren of supplies of any kind, a cheerless waste of forest and mud. Every hardship was cheerfully encountered, and the labors of the troops were repaid by the knowledge that they had taken from the enemy thirty-two guns, eleven caissons, three thousand two hundred and thirty prisoners, twelve colors, and compelled him to abandon or destroy over one hundred wagons and ambulances, and thirteen hundred and forty-eight mules.

From the 24th of January to the 27th the command was almost entirely out of rations, and some of the divisions were forced to eat the corn furnished for their horses. Supplies, however, soon arrived.

The discipline of the corps had become very much relaxed during the late campaign. General Wilson at once issued stringent orders and adopted severe measures to enforce discipline in his command. This was a task of no little difficulty. Some cases of insubordination were followed by arrests and recommendations for summary dismissal. The regiments and battalions of the corps had during their dispersion contracted customs and habits of license totally at variance with good order and military discipline, and many officers showed a degree of moral degradation unworthy of the American soldier. Roll-calls were neglected, stables unattended, camps unpoliced, and the various military duties carried on in a shiftless manner. By means of a large staff, kept constantly in motion, order was brought out of this confusion. During February fine weather permitted the troops to be well drilled,

and preparations were made to take the field during the latter part of that month, when rainy weather set in and prevented any movement. The country about Gravelly Springs was infested with guerrillas and deserters, and the stragglers of our own troops were robbing and pillaging the already impoverished inhabitants. An active provost-guard, however, in a short time put a stop to these disorders. During the early part of March the rain poured in torrents, covering the country with water. The Tennessee rose over its banks and swept off large quantities of forage. On the 9th of March orders to prepare twenty thousand men for the field were received, but the weather continued cold, rainy, and disagreeable. By the 14th, however, the Tennessee having fallen, the troops had been nearly all transferred to the south bank, but the non-arrival of forage prevented any movement. The country for ninety miles south was barren, affording no supplies, and grain had to be carried for the horses.

It had been expected that the expedition would have numbered nearly if not fully twenty-five thousand troopers; but orders were received in February to send one division of cavalry to General Canby, operating against Mobile, to leave one division at Chickasaw to watch Mississippi and the Tennessee River, and one for service in Tennessee.

The Seventh Division, General Knipe, was chosen for the first detail. General Hatch's Fifth Division remained at Chickasaw, and General R. W. Johnson's division remained in Tennessee.

Thus the scattering policy which had all along characterized the Western cavalry operations crippled General Wilson at the last moment by tearing ten thousand troopers from him, at a time, too, when we were about to penetrate a country never before to any purpose disturbed by our troops.

On the 22d of March, 1865, General Wilson, with the First, Second, and Fourth Divisions of cavalry, commanded respectively by Brigadier-General E. M. McCook, First Lieutenant Fourth Cavalry, Brigadier-General Eli Long, Captain Fourth Cavalry, and Brevet Major-General E. Upton, First Lieutenant Fifth Artillery, commenced the movement south from Chickasaw on the Tennessee. This command numbered about fourteen thousand men, of whom fifteen hundred were dismounted.

At this time Forrest was using all his energy to organize sufficient cavalry to meet an attack, but did not know where the blow would be struck. He was reported to be at or near West Point, with his troops in cantonments along the line of the railroad to Mobile, while General Roddy was at Tuscaloosa organizing his command.

Our first objective was Selma, Alabama, and the status then would direct future movements. Discretion was given to the corps commander to act as circumstances required. It will be seen that Roddy

was in position to place himself across our path, and Forrest could, if he had timely warning, move to Roddy's assistance.

Wilson directed that each trooper should have five days' light rations in haversack, one hundred rounds of ammunition, one pair of extra horseshoes; pack-mules to be loaded with five days' hard bread, ten days' sugar, ten days' salt; carried by wagons, forty-five days' coffee, twenty days' sugar, fifteen days' salt, eighty rounds ammunition. This allowance was expected to last during a sixty days' campaign. Only hard bread enough to carry us through the sterile portions of Alabama. The command was expected to live on the country. The supply-train numbered two hundred and fifty wagons,—a pontoon-train of thirty boats (canvas), transported by fifty-six 6-mule teams, accompanied us, in charge of a battalion of the Twelfth Missouri Cavalry, Major Hubbard commanding.

On the 22d of March the cavalry corps moved south, Upton's division by left-hand roads to Russellville, Long by right-hand roads, followed by McCook. The roads were still muddy, and the progress was slow, but headquarters were at Russellville on the 23d. Upton having passed through that place at 2 P.M., marching *via* Thornhill, crossing forks of the Buttahatchie, through Jasper, corps headquarters were at the Mulberry Fork of the Black Warrior on the night of the 27th. The country passed over was barren and hilly, while the creek bottoms were muddy and the crossings difficult, delaying our trains. It had rained occasionally during the march, but just before reaching the Black Warrior the rain fell in torrents, threatening to delay our crossing and cut us off from the leading division, which might then have fallen a comparatively easy prey to the enemy, if he was in force. At Russellville only a few old men could be seen. The enemy's scouts began to make their appearance in our front, and at Jasper quite a number were captured. The inhabitants reported a number of skulkers and deserters from the enemy hiding in the hills and forests to escape Forrest's patrols. Heavy roads delayed our trains. The crossing of the Mulberry Fork on the 28th required great care and took a long time. The river was much swollen, and was fully one hundred yards wide; the banks were high and steep, making the approach to the ford very difficult; a few horses were drowned. The next fork—Locust—was crossed by a beautiful ford curving down-stream, and could be followed by the change in the appearance of the water. Camping one mile from this ford, General Wilson remained until the morning of the 30th, to enable the trains and troops to close up. Upton had in the mean time pushed on to Elyton, where he arrived on the 29th. For the past four days information had been gathered to the effect that Forrest had divined our course, and was moving with all haste to head the corps off from Selma.

Having learned that the enemy had a large quantity of stores at

Tuscaloosa, and that Forrest had moved southward from that place, leaving the city unprotected, General Wilson determined to detach Croxton's brigade of McCook's division to capture it and destroy the stores, and in the mean time to push the main column with all haste towards Selma.

Croxton's march would attract the attention of a considerable force of the enemy, and if he was strongly attacked, he could fall back on the train or corps. To secure the utmost rapidity of march, it was determined to leave the train with the dismounted men of the command and a battalion of mounted men, to follow as rapidly as possible. Croxton left on the 30th for Tuscaloosa, and on the same day corps headquarters marched forty-three miles, and camped on the Cahawba River on the road to Montevallo. Upton reached Montevallo that evening, and had orders to wait for the command to close up. He had destroyed valuable iron-works during the day's march. Corps headquarters, with Long's division and Lagrange's brigade of McCook's division, arrived next day a little before noon.

From the belfry of the village church Upton's line of mounted skirmishers could be seen, a mile in front of the village, and occasional puffs of smoke told that the enemy were feeling our lines. Upton's troops not on the skirmish line were massed behind the village in some fields out of view of the enemy, while Long's splendid division of five thousand troopers was slowly closing up. Upton had ordered his skirmishers to retire slowly before the enemy, and about 1 P.M. our men could be seen moving in skirmishing order towards our lines. Moving to the rear and wheeling about to fire, every movement was marked with cool deliberation. As soon as our line was within a few hundred yards of the village, Wilson simply said, "Upton, I think you have let them come far enough; move out!" In a short time the skirmish line was reinforced, and Upton moved down the road with his main body in column of fours at the trot until he got clear of the village, when the Fifth Iowa, Colonel Young commanding, made a handsome charge, driving the enemy and capturing fifty prisoners from Roddy's command and Crossland's (Lyons's old) Kentucky Brigade. Upton drove the enemy rapidly for six miles, when we halted for the night on the road to Randolph.

On the morning of the 1st of April the march was resumed, Upton taking a left-hand road and Long confronting the enemy. McCook was sent with Lagrange's brigade to Centreville to communicate with Croxton and hold Jackson if possible. Long skirmished all day with the enemy, who retired slowly before him. At 3 P.M. Forrest, reinforced by Armstrong's brigade of Chalmers's division and some militia, halted near Ebenezer Church, five miles from Plantersville, and gave battle.

Forrest chose his position north of Bogler's Creek, his right resting

on Mulberry Creek, his left on a high wooded ridge, with three pieces of artillery on the Randolph road, and two on the Maplesville road, upon which Upton was advancing.

His troops were Roddy's division, Crossland's Kentucky Brigade, Armstrong's brigade, and three hundred infantry just from Selma.

As soon as Long could deploy he made his attack, and Upton, always prompt and lucky, heard the cheers and firing, took the trot, and turned the right flank of the enemy at the proper moment.

Forrest, expecting to be reinforced by Chalmers, who was reported within supporting distance, but who had really gone to Marion with Starke's brigade, placed his line of battle in front of the forks of the roads, with three guns on the left-hand road, upon which Long was advancing. The right-hand road does not seem to have been very well watched or strongly guarded, as Upton's advance met with very little resistance. A squadron of the Seventeenth Indiana, Miller's brigade, Long's division, armed with sabres, charged the three-gun battery, passed beyond it, but were driven back by the enemy's supports. Here Forrest had a personal encounter with one of our captains, who struck and wounded him with his sabre. Forrest killed him with his revolver, and afterwards spoke to Wilson of the captain's extreme gallantry and appeared to regret his death, but from what I have heard of Forrest's character I have my doubts about his sincerity in this respect. I believe he was a cold-blooded desperado, who delighted in recounting his deeds of blood, and had no mercy in his nature.

Forrest was driven in confusion from the field, with a loss of three guns and four hundred prisoners.

That night Long and Upton's divisions camped at Plantersville, twenty miles from Selma. The station at Randolph and five hundred bales of cotton were destroyed.

At Plantersville the enemy stopped to obtain forage and subsistence from stores there, and were driven out in hot haste, but Forrest with his body-guard made a gallant resistance.

At this time the enemy were so bewildered that they did not know what to do. Chalmers had received conflicting orders, and had gone to Marion with Starke's brigade. Jackson was north of the Cahawba, looking after Croxton, and McCook having burnt the Centreville bridge, Jackson could not join Forrest, who concluded, against the opinion of Armstrong, to fall back into Selma.

Chalmers with one brigade was at Marion, Alabama, northwest of Selma, and a little farther from that city than our troops, and we were able to outmarch him. At daylight, April 2, the troops were in motion. The enemy made no resistance. Long's division had the advance on the Summerfield road. Early in the afternoon Selma was discovered surrounded by cleared fields and defended by long lines of infantry parapets, with ditch and palisades in front, and occasional

salient works for artillery. Long was ordered to attack on the right of the Summerfield road, while Upton would attack on the left.

In front of Selma the ground was level for a mile; the only approach on the Ridge line road was by a corduroy, while the fields to the right and left were impassable on account of the mud.

A mile from Upton's line Long had a road in his front, and the ground to its right and left was tolerably firm. At Elyton we had received detailed information of the works at Selma, and Upton was ordered to move through a swamp at a point regarded by the enemy as least liable to assault, and attack at a given signal. Long's rear was covered by a creek which could only be passed by a bridge, which he strongly picketed. On his line a low ridge approached within five or six hundred yards of the enemy's works, and behind this ridge Long's division was hidden from view and fire. Two cannon-shots from the Chicago Board of Trade Battery on Long's front was to be the signal for attack. Wilson was riding in person to see the attack on Long's front, and give the signal for it, when Long's artillery opened. He had been attacked in rear by Chalmers, who had pushed down from Marion, but too late to get in the city. By destroying the bridge the creek in Long's rear would not have permitted the enemy to pass, even if the pickets had given way.

Long did not hesitate a moment, but with two dismounted regiments from each brigade, eleven hundred and sixty men in all, led by himself, Colonels Miller and Minty, he immediately charged the enemy's works, tore out the palisading, climbed in and out of the ditch, and drove out Armstrong's brigade, the best troops under Forrest's command. Our loss in this charge was forty-six killed and two hundred and seventy-eight wounded, including General Long, who was wounded in the scalp.

Upton hearing the firing on Long's front, attacked at once, and met with but slight resistance. He did not penetrate the swamp for want of time, but moved in on the corduroy road. This left the Burnsville road open, and enabled some of the enemy to escape.

The enemy rallied behind a second line of works, where they were charged by a small mounted battalion of the Fourth Cavalry. The charge was broken up by a railroad cut and some fences close to the works. The regiment lost many horses, a few men killed, and some wounded. Lieutenant Webster was shot in the arm, and Lieutenant O'Connell had his horse shot under him, and was supposed to be killed. This charge failed; but the same battalion, dismounted, and supported by the Seventeenth Indiana and Third Ohio, and a section of the Chicago Board of Trade Battery, charged again, and the line was gallantly carried. As we approached the works we had the satisfaction of seeing the bulky form of O'Connell rise from behind his dead horse, where he had been lying to avoid the enemy's fire. He was bruised,

but unwounded. By this time it was quite dark, and in the confusion and darkness Generals Forrest, Adams, Buford, and Armstrong escaped with a small portion of their commands.

The fruits of this victory were two thousand seven hundred prisoners,—one hundred and fifty being officers,—twenty-six field-guns, and one 30-pounder Parrot. An immense amount of stores fell into our hands; arsenal, naval foundry, etc., filled with an immense amount of shot, shell, guns, and various stores. Forrest's biographers, General Thomas Jordan and J. P. Pryor, give the force in Selma as follows:

Armstrong's brigade	1400
Roddy's division	1700
Total	3100

Now we captured two thousand seven hundred prisoners.

Forrest arrived at Marion on the 4th of April, where he found Jackson's division, and Chalmers with Starke's brigade.

The night that followed beggars description. Parties of our men dispersed themselves through the streets, led by the negroes, who pointed out the liquor-stores and where valuables could be found. Houses and stores were broken into and plundered. Fires broke out and threatened the city with destruction, and before order could be restored store-houses containing an abundance of rations intended for the enemy, and which would have been of immense service to our troops, were destroyed. The frightened citizens could not be made to take charge of their engines, but our provost-guards managed to check the fires by morning. Next day Selma was a sad-looking city. Upton was sent out on the 3d to drive Chalmers to the west side of the Cahawba, and to communicate with McCook; but not being able to cross the river, he joined McCook, and returned to Selma with him. The weather continued rainy, but the workshops were put in requisition and wooden pontoons built, as we had not a sufficient number to bridge the Alabama. Wilson remained at Selma until the 10th of April, waiting for Croxton and the train. McCook, who had been sent on the 1st to Croxton's assistance, met Jackson on the 2d, but finding him too strong, fell back to Centreville, burnt the bridge over the Cahawba, and marching *via* Randolph, joined the train on the 5th, and brought it safely into Selma. Croxton had encountered Jackson at Trion on the 30th, and, finding himself outnumbered, fell back a few miles and then turned north, crossed the Black Warrior, moved down its right bank, and at midnight of April 4 captured Tuscaloosa.

On the 6th, Croxton was reported marching towards Eutaw, after having burnt Tuscaloosa, where he captured three guns and sixty prisoners. He encountered General Adams at Bridgeville, forty miles southwest of Tuscaloosa, and, finding the country full of troops, he turned north; then marching back to Jasper, moved eastward, crossing the Black

Warrior at Hanley Mills. Hearing from Roddy's fugitives that Selma was in our possession, he pushed on through Northern Alabama to Talladega, dispersed Brigadier-General Hill's force of conscripts and deserters, capturing one gun, and continued his march *via* Carrollton and Newham to Forsyth, where he arrived on the 29th of April, and reported to General Wilson, who was then at Macon, Georgia.

Selma having fallen, the next step was to determine which way to march. The Confederate papers informed us that Mobile was closely besieged by our troops, and was expected to fall at any moment. They were frantically calling for reinforcements, and there were none to be had. The country around Mobile was flooded with water, our cavalry could be of no use in siege operations, and Canby had a division of cavalry with him already, enough to picket the country and protect his infantry from surprise. Wilson rightly concluded that Mobile would soon fall, and a march south would be lost time. The fall of Selma hastened the fall of Mobile. Spanish Fort fell April 8, Blakely on the 9th of April. Selma furnished the great portion of the ammunition and other war stores. Mobile surrendered April 13. On the 6th of April, Wilson met Forrest under a flag of truce at Cahawba, and learned that Croxton was safe. This also determined him to march eastward, as his anxiety was relieved. He determined to march eastward through Alabama and Georgia, and join General Sherman's army.

During the stay at Selma the work of destroying the enemy's stores and munitions of war was carried on. For several days details were employed in throwing vast quantities of shot, powder, shells, and ironwork into the Alabama River. On the night of the 6th of April the arsenal, filled with lumber, tools, machinery, etc., was fired. The spectacle was fearfully grand. The flames rolled up hundreds of feet, lighting the city and country for miles around, while hidden stores of powder blew up with fearful detonations. Fragments of shells were sent whirling through the city. Fortunately a heavy rain commenced falling soon after the fire got under way, putting out the sparks and saving the city, which otherwise would inevitably have been destroyed. While waiting for the troops to concentrate, the pontoon bridge was pushed forward as rapidly as possible, but the rain poured ceaselessly, swelling the Alabama until it was a rapid torrent. The bridge, eight hundred and seventy feet long, broke repeatedly, but at daylight of the 10th the corps was marching towards Montgomery, McCook with Lagrange's brigade in advance, skirmishing with some Alabama cavalry.

During a charge Captain Golden, a most promising officer, inspector-general of McCook's division, was drowned in Old Town Creek while trying to cross where a bridge had been destroyed. The next day's march over frightful roads and through "Big Swamp" brought us to the beautiful town of Lownesboro', a gem in this muddy

wilderness. McCook occupied Montgomery next day without resistance, although the city was strongly fortified.

The enemy had destroyed eighty-five thousand bales of cotton; we destroyed five steamers and much Confederate property.

Montgomery is a beautiful city, and the view from the top of the Capitol is magnificent. Corps headquarters remained here until the 14th, when the march was resumed towards Columbus, Georgia.

Lagrange with three regiments was detached and ordered to proceed to West Point, at the crossing of the Chattahoochee River by the Atlanta and West Point Railroad. This movement had two objects in view: first, to secure the railroad and other bridges; second, the destruction of the vast amount of rolling-stock and other property, and the capture of the garrison. It was important to secure the bridge, as the river was not fordable at Columbus, Georgia, and if we should fail in our attempt at that place, we could still secure a crossing at West Point. Passing through Tuskeegee, a quiet country town, we arrived late in the afternoon of the 16th in front of the defenses of Columbus. The city lies on the east bank of the Chattahoochee. The defenses on the west bank consisted of infantry parapets, strengthened by earthworks for artillery. The work at the west end of the bridge was a very strong one. Abattis covered the whole front with the exception of the road. The line was reconnoitred, and Upton placed his troops in position. At 8 P.M., with three hundred dismounted men of the Third Iowa, he attacked and carried the enemy's works in magnificent style, and a mounted squadron of the Tenth Missouri moving down the open roadway, passed alongside of the strong bridge-head, saved the bridge, stopped the flying enemy, securing twelve hundred prisoners. Our loss was only twenty men killed and wounded. Fifty-two field-guns in position fell into our hands. General Winslow, of Upton's division, destroyed on the 17th the iron ram "Stonewall Jackson," mounting six 7-inch rifles, nearly ready for sea, burnt navy-yard, arsenal, foundry, armory, sword and pistol factory, accoutrement-shops, paper-mills, cotton-mills, all the bridges on the river, fifteen locomotives, two hundred cars, one hundred thousand bales of cotton, and an immense quantity of artillery ammunition. If it had been known that the bottom had dropped out of the Confederacy, millions might have been saved. So rapidly were the works carried that General Cobb, who was in command of the enemy's troops, had not time to get across the river to his line of works. The squadron already spoken of stopped him at the bridge, and killed his adjutant-general and some of his orderlies. The citizens awoke next morning surprised to find the Yankees in possession. Some plundering occurred, but the Selma scenes were not re-enacted. The factory-girls and others assisted our braves in their efforts to despoil the Georgian. I sometimes think it would have been a just retribution to have carried sword and flame

through Georgia. The mind cannot without a shudder venture into the prison-pens of Andersonville to contemplate the misery of the unhappy Union prisoners. When the thought of that terrible place and the sacrifice of so many thousands of brave men comes back to us, it seems as if Omnipotence itself would have poured out vials of wrath and destroyed the State that could calmly witness such diabolical cruelty. The savage, devilish, bestial apathy which pervaded the people of Georgia while such misery existed within their borders belongs to the dwellers of hell itself.

Lagrange in the mean time had assaulted Fort Tyler, at West Point, on three sides, bridged its ditches, and after a stubborn defense had captured the works, with nearly three hundred prisoners and three guns. He burnt nineteen locomotives, two hundred cars, and a large quantity of supplies. On the 17th, Minty's division (Long having been wounded) moved towards Macon, and on the 18th his advance by a forced march secured the double bridge across the Flint River, fifty-four miles from Columbus, forcing the flying enemy to abandon three field-pieces and thirteen wagon-loads of machinery. Forty prisoners were picked up on the road. Colonel White's Seventeenth Indiana marched one hundred and four miles since 6 P.M. of the 17th. On the 19th, Minty's advance had a slight skirmish, and picked up two more abandoned guns. Headquarters this night at Thomaston. Every effort was now made to reach Macon at the earliest practicable moment to prevent reinforcements from being thrown into the city, so as not to give the already demoralized enemy time to reorganize. Thomaston is about fifty miles from Macon, but a large portion of our force marched nearly to the city that day. During the afternoon General Wilson received information of the armistice between Generals Sherman and Johnston, and was requested by General Howell Cobb to arrest the march of his troops, but before Wilson could give the order our advance had penetrated the works surrounding Macon, and at 6 P.M., April 20, General Howell Cobb surrendered the city. Colonel White, of the Seventeenth Indiana, had the advance, and when within thirteen miles of Macon he met General Robinson with a flag of truce and a letter to the officer commanding the troops. White sent it to Minty, who ordered White to advance, and at the same time transmitted the letter to Wilson, who was at the head of Upton's division, some miles to the rear. General Cobb sent news of the truce, and wanted to make arrangements for his own troops, but White reached the suburbs of the city and entered the works under protest. Wilson did not entertain any doubt of the truce, but he wanted to hear direct from General Sherman before he committed himself.

Little else remains to be told. The cavalry was distributed through Georgia and Florida, receiving the surrender of detached commands, but within a few weeks most of the regiments were mustered out

of service. The last act of any importance was the capture of Jefferson Davis by Lieutenant-Colonel D. B. Pritchard, Fourth Michigan Cavalry.

Recapitulation of Trophies.

Colors		23
Guns at Ebenezer Station		3
" " Selma		29
" " Montgomery		5
" " Columbus		52
" " West Point		3
" " Tuscaloosa		3
" " Talladega		1
		— 96
Guns at Selma, in arsenal		70
" " Columbus, in arsenal		10
" " Macon, in arsenal		60
" on road		5
		— 145
Total		241
Prisoners at Ebenezer Station		300
" " Russellville		82
" " Selma		2700
" " Montgomery		50
" " Columbus		1200
" " West Point		350
" " Macon		1500
" " Talladega		150
" " Tuscaloosa		150
		6482

E. B. Beaumont,
Bvt. Lt.-Col. U.S.A.

EDITORIAL NOTES.

It is difficult to conceive of a more delicate or humiliating position in which a nation could be placed than the one which Great Britain occupies in Afghanistan at the date of this writing. She has not conquered the country; she has not obtained any one of the several objects for which she professedly entered upon the war. On the contrary, the Afghans are more united and more formidable to-day than they were the day the British troops crossed their frontier. Their factional differences have disappeared in the presence of the common enemy, and their Moslem hatred of the Christian has crystallized into a fanatical uprising of the whole people. What, then, is Great Britain to do? To remain is to enter upon a bitter, costly, semi-guerrilla war, in which religious fanaticism on the one side, and "political expediency" on the other, will be the controlling influences. To retire is to confess herself beaten, in giving up the contest without accomplishing her object. In the one case she would bring down upon herself the certain loss of thousands of her sons and the expenditure of millions of pounds in money, wrung from an already overtaxed and starving people. In the other case she would receive the contempt of the world abroad, and the overthrow of her present governing ministry by an outraged and incensed people at home. That the gravity of the situation is fully appreciated in London, and that the ministry there are anxious to change their Eastern policy if they can find a reasonable pretext upon which to do so, and if they find that the sentiment at home will sustain them in it, is evident from a recent declaration of the *Times*, to the effect that "we can now retire from Afghanistan with honor and safety."(?) This may be accepted as a semi-official "feeler," to sound popular opinion upon the subject. If that opinion should seem to be favorable or passive, we may look for an early retirement of the British troops from Afghanistan,—followed by an early retirement of the Beaconsfield ministry from Downing Street,—because, while the British people may be willing, for certain politic reasons, to bring the Afghan war to a sudden, if not an inglorious, end, they will not be willing to continue in power a party government which brought the misery, expense, and humiliation of that war upon them.

THE news from the seat of war in South America is so meagre and conflicting that it is not easy to acquire any definite knowledge of the actual state of affairs there, or to express any decided opinion upon the movements and events reported. Judging from all the published accounts, the advantages of the contest are increasingly in favor of Chili, several battles having been won by her troops, who, according to the latest advices, were threatening Lima, the capital of Peru. It is reported, though with what truth is not yet known, that Bolivia—which country gave the original provocation for the war—has withdrawn from the triangular contest, leaving Peru, her ally, to face Chili alone. As the latter country had already shown herself more than a match for the other two combined, the end, which is a foregone conclusion, must be near at hand. In this war, Chili deserves the sympathy, as she has won the admiration, of the world. We speak from personal knowledge in saying that the Chilians are the most intelligent and progressive people in South America; they have done more towards establishing a stable government, and developing the natural resources of their country, than any of their neighbors; and anything which tends to strengthen them is, by its influence upon all around, just so much benefit to South America in particular, and to the world in general.

IN his last annual report the Secretary of the Navy again makes the frequently-urged and too-long-unheeded recommendation that the sailors and apprentice-boys be furnished with an annual allowance of clothing by the government free of charge, as is the case with the soldiers. At present, men and boys shipping in the navy must at once become indebted to the government to the amount of several months' pay for their necessary outfit, and cannot receive one dollar of their pay in cash, except by special authority, while any portion of that debt stands against them. This is not only a crying grievance in itself, but it is the direct cause of much (not wholly unjustified) dissatisfaction among the men,—a dissatisfaction which frequently leads to the desertion of the complaining ones, and to the demoralization of those remaining. Why sailors should be compelled to go into debt to pay for their clothing, while soldiers are given a necessary allowance free of charge, is a discrimination the justice or wisdom of which is not apparent. As the Secretary stated in the report alluded to, "Strict justice requires that all seamen, in this respect, shall be placed upon the same footing with soldiers," and it is to be hoped that Congress will listen to the unanimous voice of the navy, as heard in that statement, and provide accordingly.

THE most melancholy feature in connection with the recent Ute outbreak is the reflection that it was to have been expected in the ordinary course of Indian affairs, and that we may look, with absolute certainty of the fulfillment of our fears, for a frequent repetition of just such outbreaks as long as the present iniquitous Indian policy remains in operation. The subsequent effort of certain well-meaning but impractical theorists to obtain a "peaceable" settlement of the matter by temporizing with the Indians, and demanding the surrender of the leaders in the trouble, was altogether too farcical in its nature to be treated as a serious possibility, and was too serious in its effects to be treated as a farce. No one conversant with the nature of the Indians supposed for a moment that the policy pursued towards the Utes would be successful in accomplishing the desired object; and that those who directed this policy were not qualified to deal with the subject is too painfully evident from the failure of the negotiations to need the assertion of it here. These remarks are not the expression of *ex post facto* wisdom. We foresaw a month ago what we foresee and prophesy now,—that the Interior Department will have to confess its inability to settle the matter satisfactorily, and will have to turn it over to the War Department for settlement. Had this been done three months ago,—had Generals Hatch and Merritt then been permitted to deal with the Indians as they must eventually be dealt with, the "Ute question" would now be among the many settled Indian questions of the past. As it is now, the army has the certainty before it of having another Indian campaign to enter upon, and the country has another forcible argument in favor of the transfer of the Indian Bureau from the control of a department which cannot properly conduct it, to one, and the only one, which can.

THE annual report of the General Superintendent of the Life-Saving Service gains additional interest year after year, as the operations of the service become more widely extended and its beneficent results correspondingly increased. The report recently issued shows that during the year there were 219 disasters to vessels within the limits of the operations of the service. On these vessels there were 2107 persons, of whom 2049 were saved and only 58 lost. The life-saving crews got 89 vessels afloat, and saved $1,445,086 worth of property out of $2,887,886 worth involved. Since 1871 the service has saved 8030 lives and $23,155,435 worth of property. There are now 172 stations on the Atlantic, the Pacific, the Gulf, and the Lakes, but a few additional stations are needed at specially dangerous points, and it is to be hoped that the Superintendent's appeal for an appropriation for the establishment of these stations may be granted. The Life-Saving Service has now attained a degree of completeness and efficiency as

creditable to those in charge as it is gratifying to the general public, and Congress cannot make appropriations for a more noble and deserving work.

"WHAT is the use of a navy in time of peace?" is a question not infrequently asked by a certain class of persons who seem to suppose that a man-of-war is useful only for war purposes, and is utterly useless for all others. Leaving out of consideration the fact that "in time of peace prepare for war" is an advisory warning applicable to naval as well as land preparations, it may be said that a navy has quite as important duties to perform in one season as in the other. Those who desire to learn what those duties are should read the excellent article by Rear-Admiral Daniel Ammen, U.S.N., entitled "The Purposes of a Navy," which was published in THE UNITED SERVICE for last April. The latest illustration of the value of a navy in time of peace is furnished in the reports of Commodore R. W. Shufeldt, U.S.N., on board the U. S. S. "Ticonderoga," which vessel is now cruising along the coast of Africa, taking soundings, making explorations, and looking after the commercial interests of the United States in that quarter of the globe. These reports embody much information of great value, and indicate that the officers of the vessel named are faithfully and zealously performing the duties for which they were selected, every officer, in addition to his regular duty on board, having some special task to perform in connection with the object of the cruise. While we cannot reasonably expect as great commercial advantages to follow Commodore Shufeldt's voyage to Africa as resulted from Commodore Wilkes's expedition to Japan, which opened a new empire to the commerce of the world, there is no doubt that the former will prove to be, in the extent and value of the scientific and general information which its final reports will furnish, probably the most important cruise ever made by a man-of-war. The commercial, scientific, and geographical worlds owe a vast deal to the American navy,—to the enterprise and explorations of its officers,—as shown in the innumerable instances which might be cited, the case of the "Ticonderoga" being only the latest of the many practical answers which could be given to the query that begins this paragraph.

THE plan of educating a number of young men every year at the Naval Academy as cadet engineers to fill vacancies in the engineer corps of the navy has now been in operation a sufficiently long time to permit judgment to be passed upon its efficiency in fulfilling the

desired object. It will be generally admitted that the plan has fully realized the highest anticipations of its advocates. The personal character and the professional attainments of the young gentlemen who have thus far been graduated from the Academy and been appointed in the service bear flattering testimony to the wisdom of the measure, and none speak more warmly of its resulting benefits upon the corps in particular, and upon the service in general, than the older engineers, who are best qualified to pass judgment upon the subject.

ACCORDING to a recent rather apocryphal dispatch from Europe, Prince Bismarck is reported as recommending to the great powers a general reduction in the strength of their standing armies. Aside from the fact that such a report is to be classed among the many that are too good to be true, it sounds like an exquisite piece of sarcasm to attribute it to the one who, more than any other man of the age, is responsible for the creation and maintenance of that curse of modern Europe—enormous standing armies. That such a general disarmament must come sooner or later seems to be inevitable. The European nations cannot live forever under the crushing weight, and the increasing drain upon all their resources, of their present vast military establishments; but it may be safely said that the first practical step towards disarmament will not be made by the government of the Iron Prince,—a government resting upon bayonets, without the support of which it would soon fall into disintegration.

WE take pleasure in announcing that the March number of THE UNITED SERVICE will contain the following articles of special interest: "Facts in Favor of Compulsory Retirement," by General Emory Upton, U.S.A.; "The Paraguay Expedition," by Medical Director Edward Shippen, U.S.A.; "Reminiscences of Plevna," by Lieutenant F. V. Greene, U.S.A.; "Heavy Guns," by Prof. John M. Brooke; "How we stopped a Leak," being Whiff the Third from an Old Sailor's Pipe; "Military Instruction in Colleges," by Captain H. Romeyn, U.S.A.; "An Island in the Air" (poem), by Commander William Gibson, U.S.N.; "How to make Post-Gardens Pay," by Burnet Landreth; "Collisions at Sea," by Lieutenant Seaton Schroeder, U.S.N.; "The War of 1812," by General T. Bailey Myers; "The Battle of New Orleans," by Commodore Geo. M. Ransom, U.S.N.

SERVICE LITERATURE.

A "GENERAL NAVY REGISTER FROM 1789 TO 1880," by Jesse E. Dow and J. H. Dulin, both of the Navy Department, will be issued by Messrs. L. R. Hamersly & Co. some time during the present year.

THE work of Lieutenant F. V. Greene, U.S.A., on the Russo-Turkish war, has been very favorably criticised by the British press, which commend it as one of the best books yet published upon the subject.

REAR-ADMIRAL PREBLE'S "History of the Flag," which he is now revising and enlarging, will soon be republished.

MESSRS. SCHUYLER, HARTLEY & GRAHAM, publishers of *The Field Glass*, have issued in pamphlet form the series of articles which appeared in the paper named on "The Command of the Army," by General James B. Fry, U.S.A., and Colonel William M. Wherry, U.S.A. These articles are of as much interest to the public generally as they are to the service, explaining, as they do, the relative rights and duties of the President, the Secretary of War, and the General in relation to the subject discussed.

IMMEDIATELY after the battle between the Peruvian ironclad "Huascar" and the Chilian fleet, Rear-Admiral C. R. P. Rodgers, U.S.N., commanding the South Pacific Station, ordered a board of officers to examine and report upon the condition of the vessel named, after her capture by the Chilians. The report of that board has just been published, making a unique and an interesting addition to our naval literature.

REAR-ADMIRAL DANIEL AMMEN, U.S.N., is now writing "The Career of Commander W. B. Cushing, U.S.N.," and will be obliged to officers and others who may furnish him with notes pertinent to his subject. Such notes can be addressed to the care of THE UNITED SERVICE Magazine.

IT may interest our readers to know that Mr. J. H. Siddons, whose "Autobiography of a British Soldier" is now appearing in the pages of THE UNITED SERVICE, is an ex-officer of the British army, and an author of recognized ability and wide reputation, as the following list of his published works will show: "History of the British Army, from the Restoration to the Fall of Magdala;" "A Personal History of the Horse Guards;" "The Life of the Duke of Wellington;" "Memoirs of Afghanistan, 1838–43;" "The Old Field Officer,—An Imaginary History of a Career;" "The War in Italy;" "The Punjaub;" "The Indian Mutiny—Its Cause;" "The Volunteer's Hand-Book;" "The Military Encyclopedia;" and the article "Army" in the "Encyclopædia Britannica."

BREVET LIEUTENANT-COLONEL GARRICK MALLERY, U.S.A., of the Bureau of Ethnology, Smithsonian Institution, Washington, D. C., who contributes to this number of THE UNITED SERVICE the able article on the sign-language of the North American Indians, is engaged upon an illustrated publication to be issued by that Bureau, in which the subject will be exhaustively treated, and the signs and gestures of the Indians compared with those of foreign tribes of men. Officers of the army and navy who are familiar with the sign-languages of native or foreign tribes, are solicited to send contributions upon the subject to Colonel Mallery. To all contributions published there will be given individual credit and responsibility, and printed forms and outlines prepared to diminish the labor of description and illustration, with other facilities for correspondence, will be furnished on request to the above address.